



	E	F	N	I	S	Q	H	Q	C	V	K	K	Q	C	P	E	N
Bac 19	<u>GAA</u>	TTC	AAC	ATC	TCG	CAG	CAC	CAA	TGC	GTG	AAA	AAA	CAA	TGT	CCC	GAG	AAC
PF 19			AAC	ATT	TCA	CAA	CAC	CAA	TGC	GTA	AAA	AAA	CAA	TGT	CCA	GAA	AAT

	S	G	C	F	R	H	L	D	E	R	E	E	C	K	C	L	L
Bac 19	TCT	GGC	TGT	TTC	AGA	CAC	TTG	GAC	GAG	AGA	GAG	GAG	TGT	AAA	TGT	CTG	CTG
PF 19	TCT	GGA	TGT	TTC	AGA	CAT	TTA	GAT	GAA	AGA	GAA	GAA	TGT	AAA	TGT	TTA	TTA

	N	Y	K	Q	E	G	D	K	C	V	E	N	P	N	P	T	C
Bac 19	AAC	TAC	AAA	CAG	GAG	GGC	GAC	AAG	TGC	GTG	GAG	AAC	CCC	AAC	CCG	ACC	TGT
PF 19	AAT	TAC	AAA	CAA	GAA	GGT	GAT	AAA	TGT	GTT	GAA	AAT	CCA	AAT	CCT	ACT	TGT

	N	E	N	N	G	G	C	D	A	D	A	K	C	T	E	E	D
Bac 19	AAC	GAG	AAC	AAC	GGC	GGC	TGT	GAC	GCA	GAC	GCC	AAA	TGC	ACC	GAG	GAG	GAC
PF 19	AAC	GAA	AAT	AAT	GGT	GGA	TGT	GAT	GCA	GAT	GCC	AAA	TGT	ACC	GAA	GAA	GAT

	S	G	S	N	G	K	K	I	T	C	E	C	T	K	P	D	S
Bac 19	TCG	GGC	AGC	AAC	GGC	AAG	AAA	ATC	ACG	TGT	GAG	TGT	ACC	AAA	CCC	GAC	TCG
PF 19	TCA	GGT	AGC	AAC	GGA	AAG	AAA	ATC	ACA	TGT	GAA	TGT	ACT	AAA	CCT	GAT	TCT

	Y	P	L	F	D	G	I	F	C	S	*	*
Bac 19	TAC	CCG	CTG	TTC	GAC	GGC	ATC	TTC	TGC	AGC	TAA	TAA
PF 19	TAT	CCA	CTT	TTC	GAT	GGT	ATT	TTC	TGC	AGT		

**FIG. 1A**

Site Eco RI

	E	F	N	I	S	Q	H	Q	C	V	K	K	Q	C	P	E	N
Bac 19	GAA	TTC	AAC	ATC	TCG	CAG	CAC	CAA	TGC	GTG	AAA	AAA	CAA	TGT	CCC	GAG	AAC
PF 19	AAC	ATT	TCA	CAA	CAC	CAA	TGC	GTA	AAA	AAA	CAA	TGT	CCA	GAA	AAT		

	S	G	C	F	R	H	L	D	E	R	E	E	C	K	C	L	L
Bac 19	TCT	GGC	TGT	TTC	AGA	CAC	TTG	GAC	GAG	AGA	GAG	GAG	TGT	AAA	TGT	CTG	CTG
PF 19	TCT	GGA	TGT	TTC	AGA	CAT	TTA	GAT	GAA	AGA	GAA	GAA	TGT	AAA	TGT	TTA	TTA

	N	Y	K	Q	E	G	D	K	C	V	E	N	P	N	P	T	C
Bac 19	AAC	TAC	AAA	CAG	GAG	GGC	GAC	AAG	TGC	GTG	GAG	AAC	CCC	AAC	CCG	ACC	TGT
PF 19	AAT	TAC	AAA	CAA	GAA	GGT	GAT	AAA	TGT	GTT	GAA	AAT	CCA	AAT	CCT	ACT	TGT

	N	E	N	N	G	G	C	D	A	D	A	K	C	T	E	E	D
Bac 19	AAC	GAG	AAC	AAC	GGC	GGC	TGT	GAC	GCA	GAC	GCC	AAA	TGC	ACC	GAG	GAG	GAC
PF 19	AAC	GAA	AAT	AAT	GGT	GGA	TGT	GAT	GCA	GAT	GCC	AAA	TGT	ACC	GAA	GAA	GAT

	S	G	S	N	G	K	K	I	T	C	E	C	T	K	P	D	S
Bac 19	TCG	GGC	AGC	AAC	GGC	AAG	AAA	ATC	ACG	TGT	GAG	TGT	ACC	AAA	CCC	GAC	TCG
PF 19	TCA	GGT	AGC	AAC	GGA	AAG	AAA	ATC	ACA	TGT	GAA	TGT	ACT	AAA	CCT	GAT	TCT

	Y	P	L	F	D	G	I	F	C	S	S	S	N	F	L	G	I
Bac 19	TAC	CCG	CTG	TTC	GAC	GGC	ATC	TTC	TGC	AGC	TCC	TCT	AAC	TTC	TTG	GGC	ATC
PF 19	TAT	CCA	CTT	TTC	GAT	GGT	ATT	TTC	TGC	AGT	TCC	TCT	AAC	TTC	TTA	GGA	ATA

	S	F	L	L	I	L	M	L	I	L	Y	S	F	I	*	*
Bac 19	TCG	TTC	TTG	TTG	ATC	CTC	ATG	TTG	ATC	TTG	TAC	AGC	TTC	ATT	TAA	TAA
PF 19	TCA	TTC	TTA	TTA	ATA	CTC	ATG	TTA	ATA	TTA	TAC	AGT	TTC	ATT		

**FIG. 1B**

ATG AAG GCG CTA CTC TTT TTG TTC TCT TTC ATT TTT TTC GTT ACC AAA TGT  
M K A L L F L F S F I F F V T K C

CAA TGT GAA ACA GAA AGT TAT AAG CAG CTT GTA GCC AAC GTG GAC GAA TTC  
Q C E T E S Y K Q L V A N V D E F

AAC ATC TCG CAG CAC CAA TGC GTG AAA AAA CAA TGT CCC GAG AAC TCT GGC  
N I S Q H Q C V K K Q C P E N S G

TGT TTC AGA CAC TTG GAC GAG AGA GAG GAG TGT AAA TGT CTG CTG AAC TAC  
C F R H L D E R E E C K C L L N Y

AAA CAG GAG GGC GAC AAG TGC GTG GAG AAC CCC AAC CCG ACC TGT AAC GAG  
K Q E G D K C V E N P N P T C N E

AAC AAC GGC GGC TGT GAC GCA GAC GCC AAA TGC ACC GAG GAG GAC TCG GGC  
N N G G C D A D A K C T E E D S G

AGC AAC GGC AAG AAA ATC ACG TGT GAG TGT ACC AAA CCC GAC TCG TAC CCG  
S N G K K I T C E C T K P D S Y P

CTG TTC GAC GGC ATC TTC TGC AGC TAA TAA  
L F D G I F C S \* \*

*FIG. 1C*

GAA ACA GAA AGT TAT AAG CAG CTT GTA GCC AAC GTG GAC GAA TTC  
E T E S Y K Q L V A N V D E F

AAC ATC TCG CAG CAC CAA TGC GTG AAA AAA CAA TGT CCC GAG AAC TCT GGC  
N I S Q H Q C V K K Q C P E N S G

TGT TTC AGA CAC TTG GAC GAG AGA GAG GAG TGT AAA TGT CTG CTG AAC TAC  
C F R H L D E R E E C K C L L N Y

AAA CAG GAG GGC GAC AAG TGC GTG GAG AAC CCC AAC CCG ACC TGT AAC GAG  
K Q E G D K C V E N P N P T C N E

AAC AAC GGC GGC TGT GAC GCA GAC GCC AAA TGC ACC GAG GAG GAC TCG GGC  
N N G G C D A D A K C T E E D S G

AGC AAC GGC AAG AAA ATC ACG TGT GAG TGT ACC AAA CCC GAC TCG TAC CCG  
S N G K K I T C E C T K P D S Y P

CTG TTC GAC GGC ATC TTC TGC AGC TAA TAA  
L F D G I F C S \* \*

*FIG. 1D*

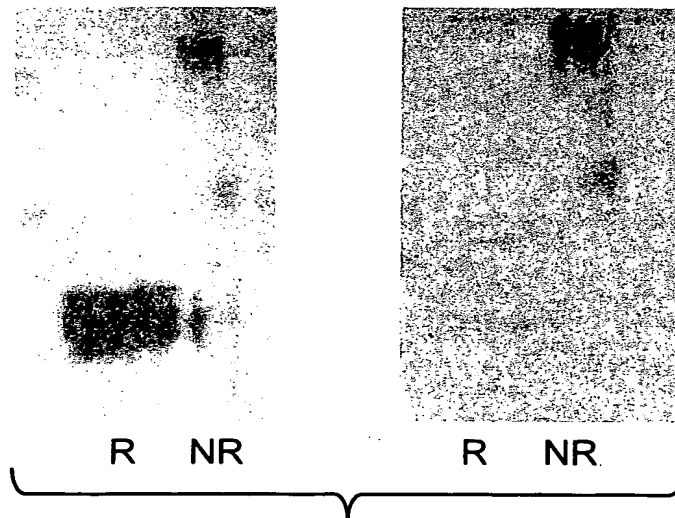
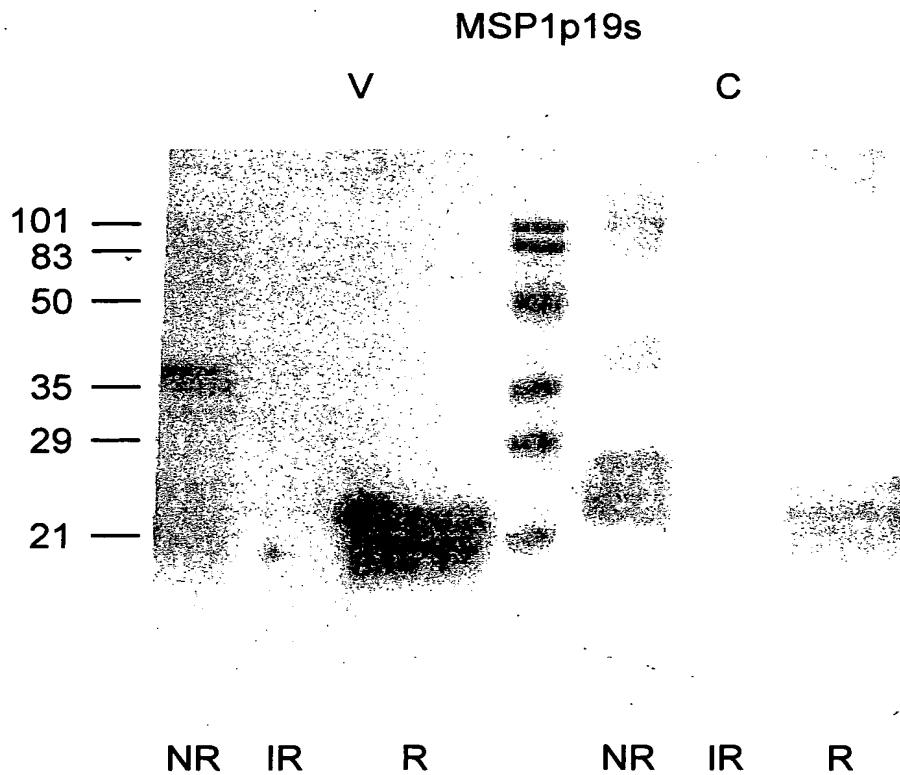


FIG.2A



**FIG.2B**

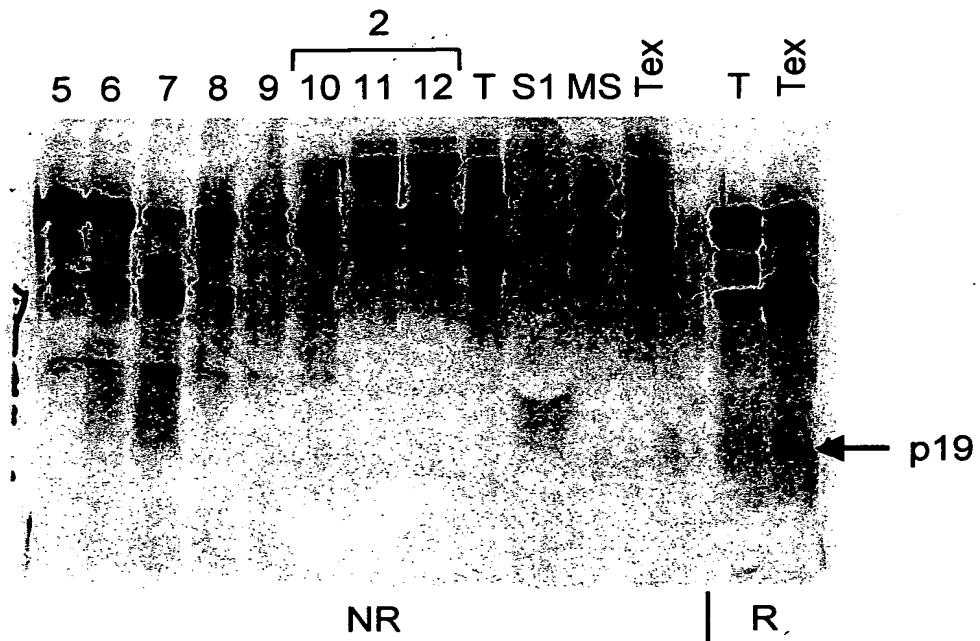


FIG.3A





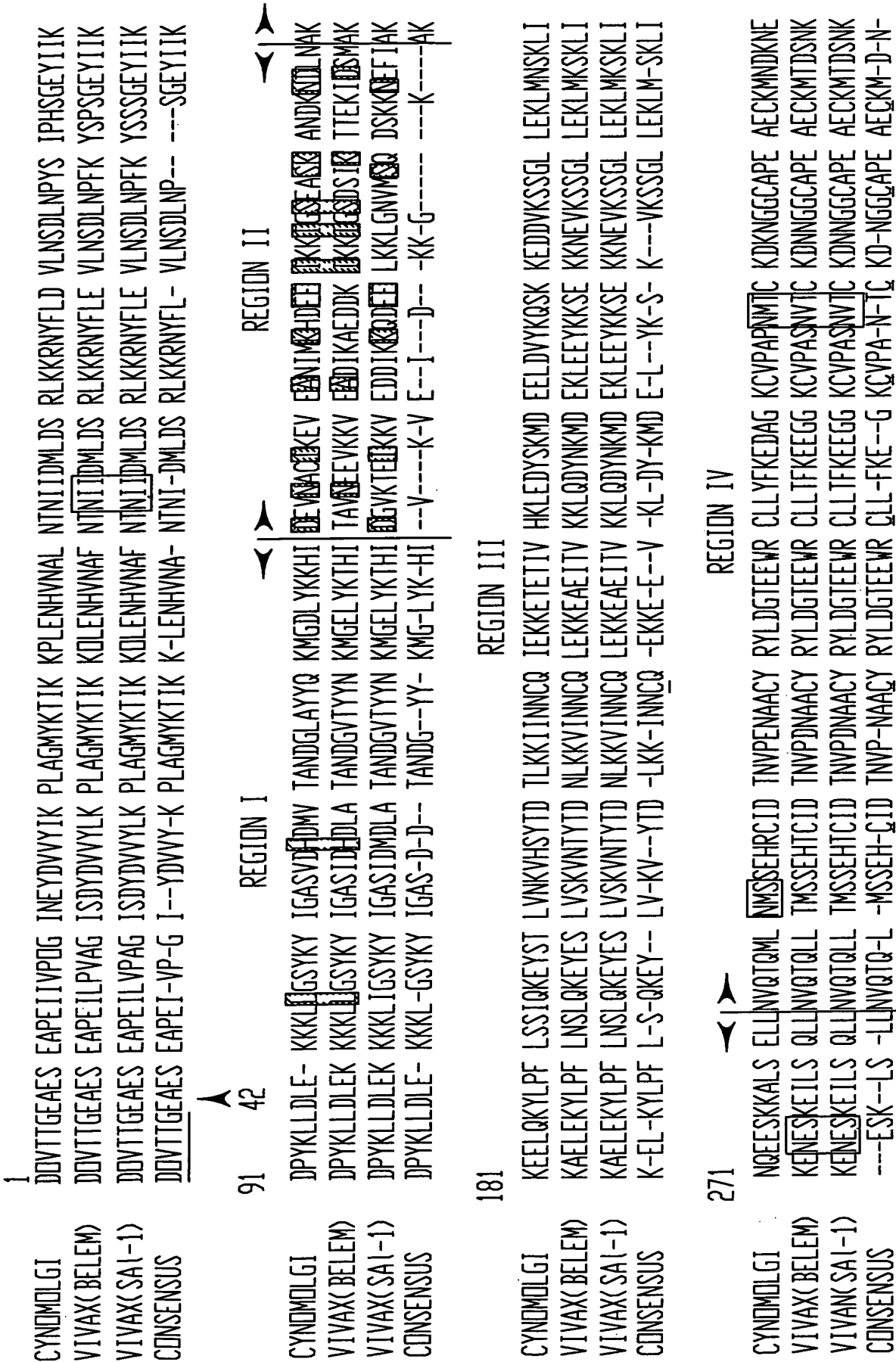
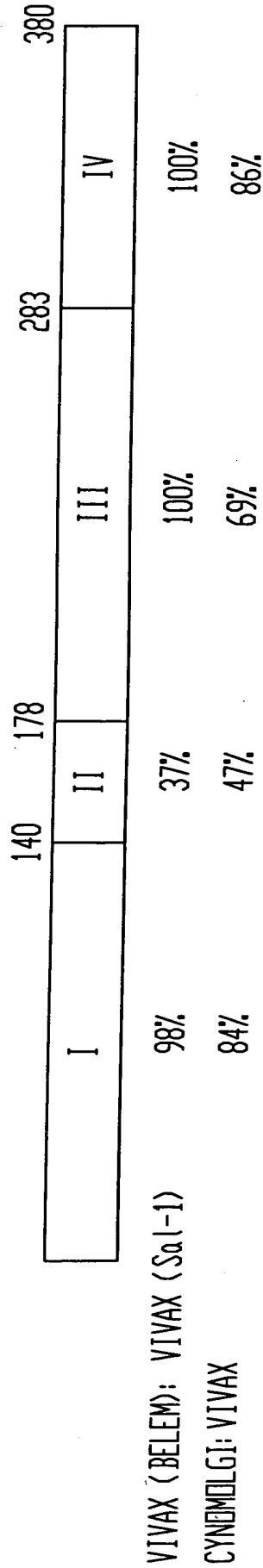


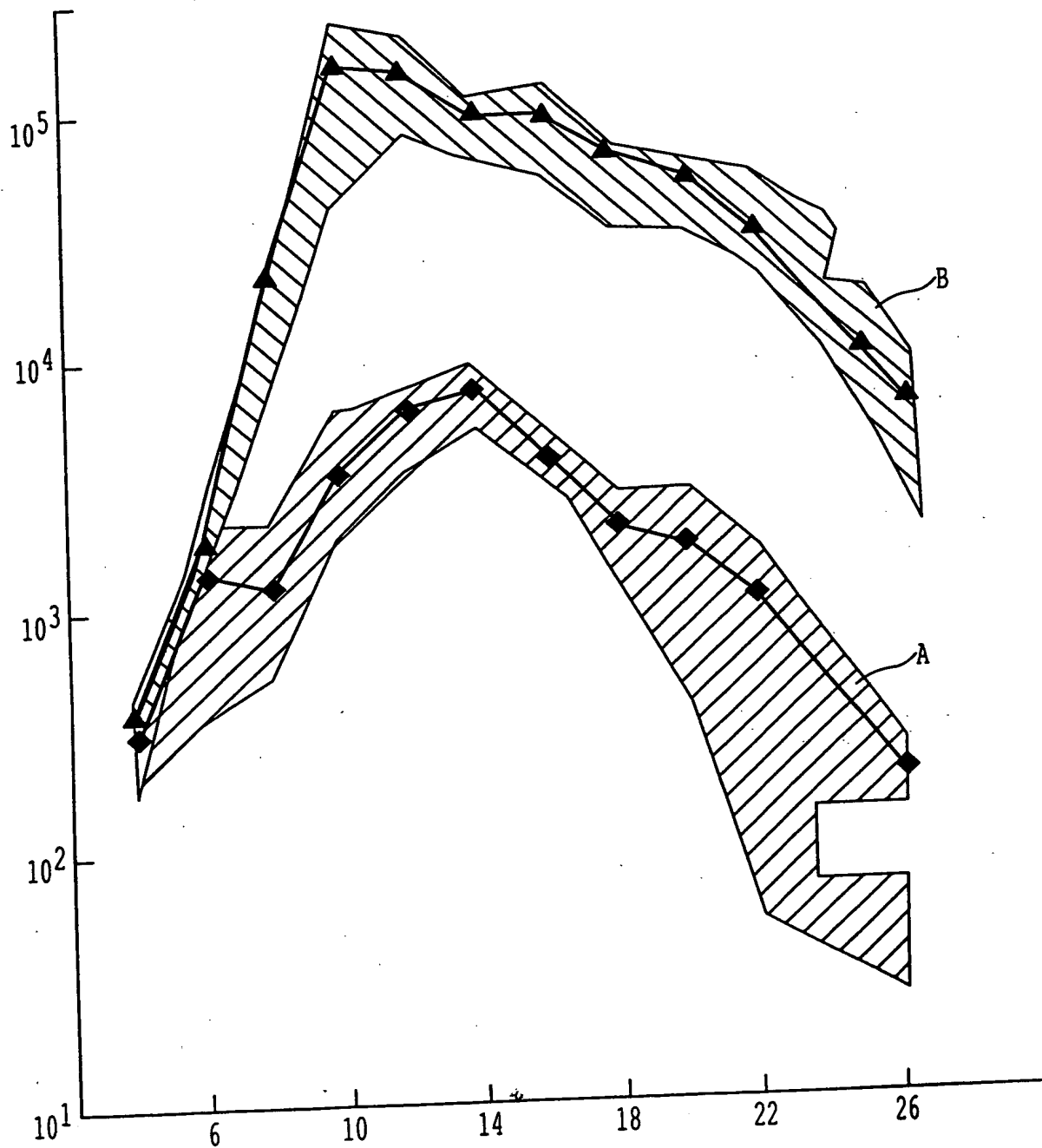
FIG. 4A.1

361  
 CYNOMOLGI IVCKCTKEGS EPLFEGVFCS  
 VIVAX(BELEM) IVCKCTKEGS EPLFEGVFCS  
 VIVAX(SA1-1) IVCKCTKEGS EPLFEGVFCS  
 CONSENSUS IVCKCTKEGS EPLFEGVFCS

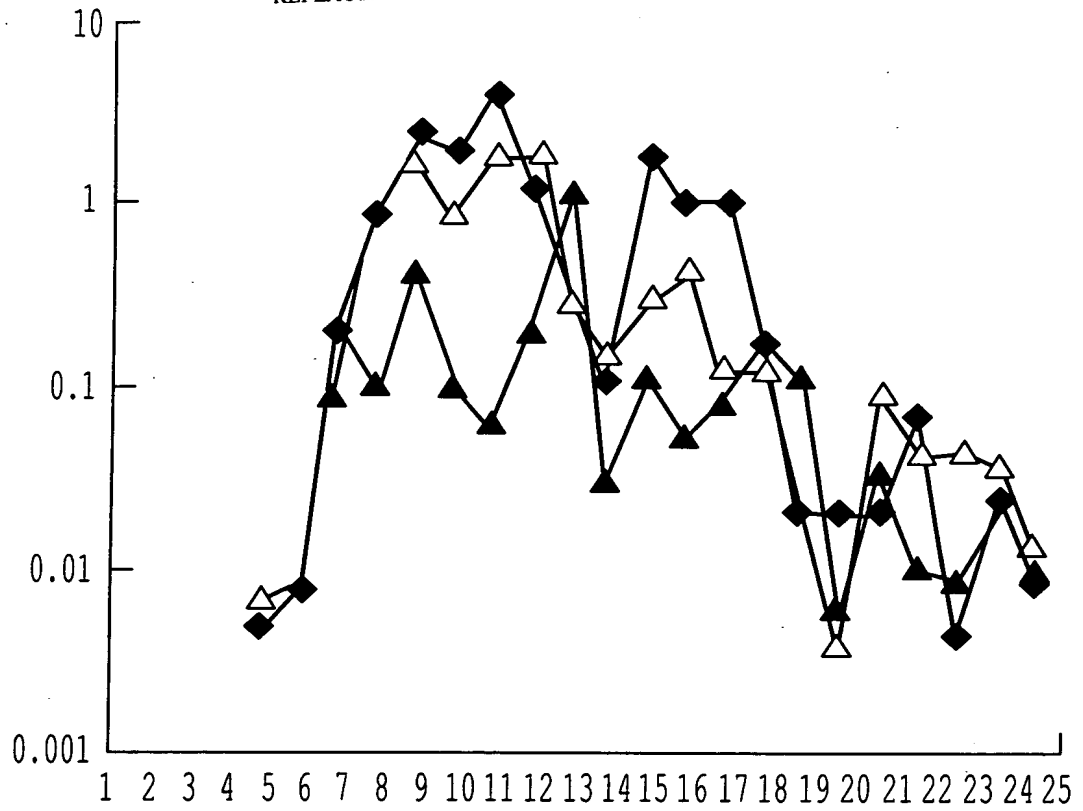
*FIG. 4A.2*



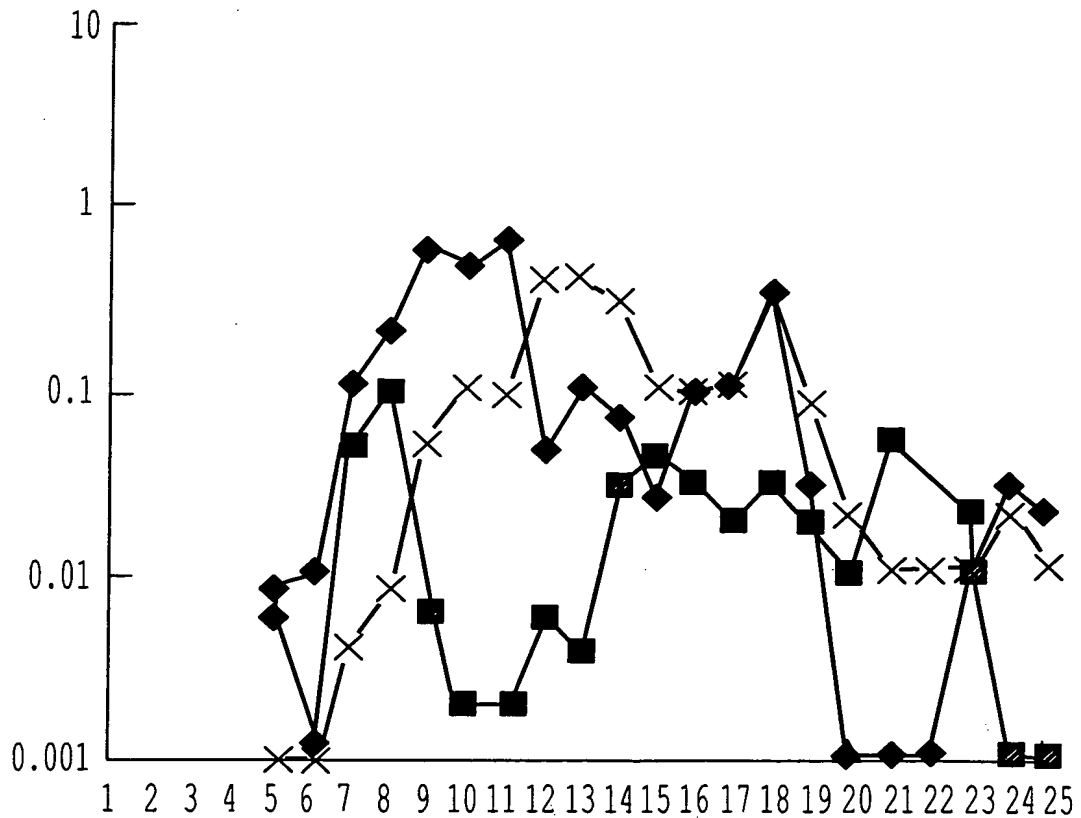
*FIG. 4B*



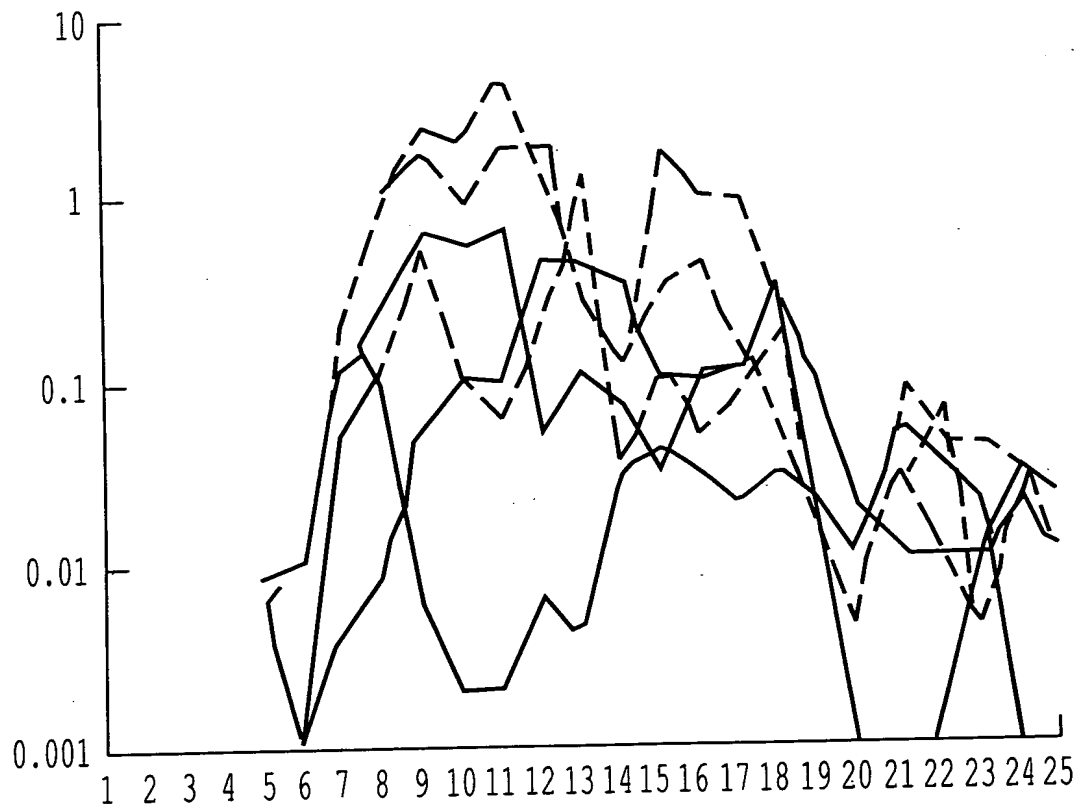
*FIG. 5*



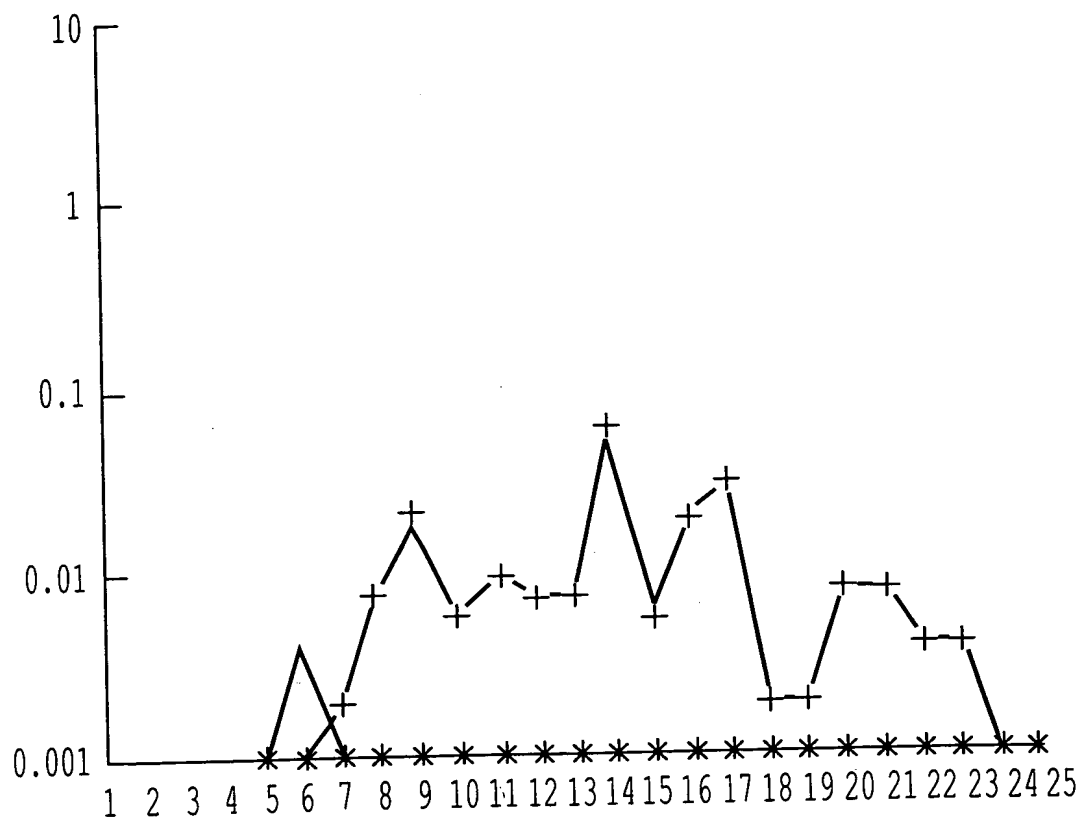
**FIG. 6A**



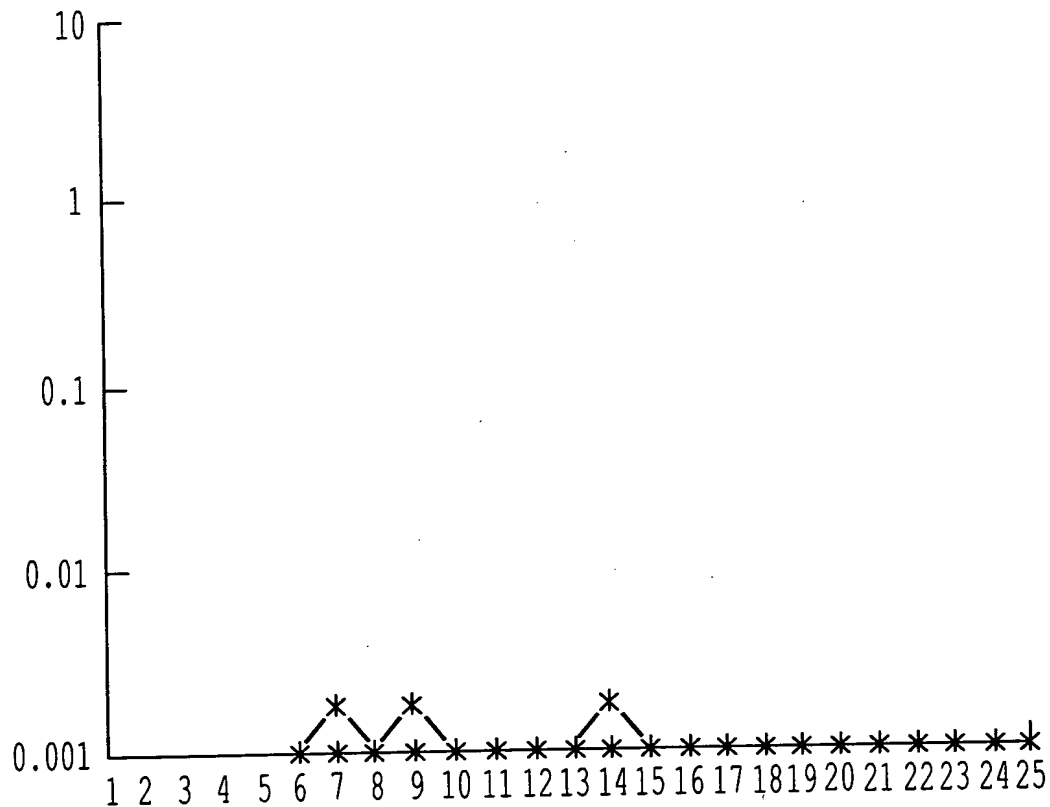
**FIG. 6B**



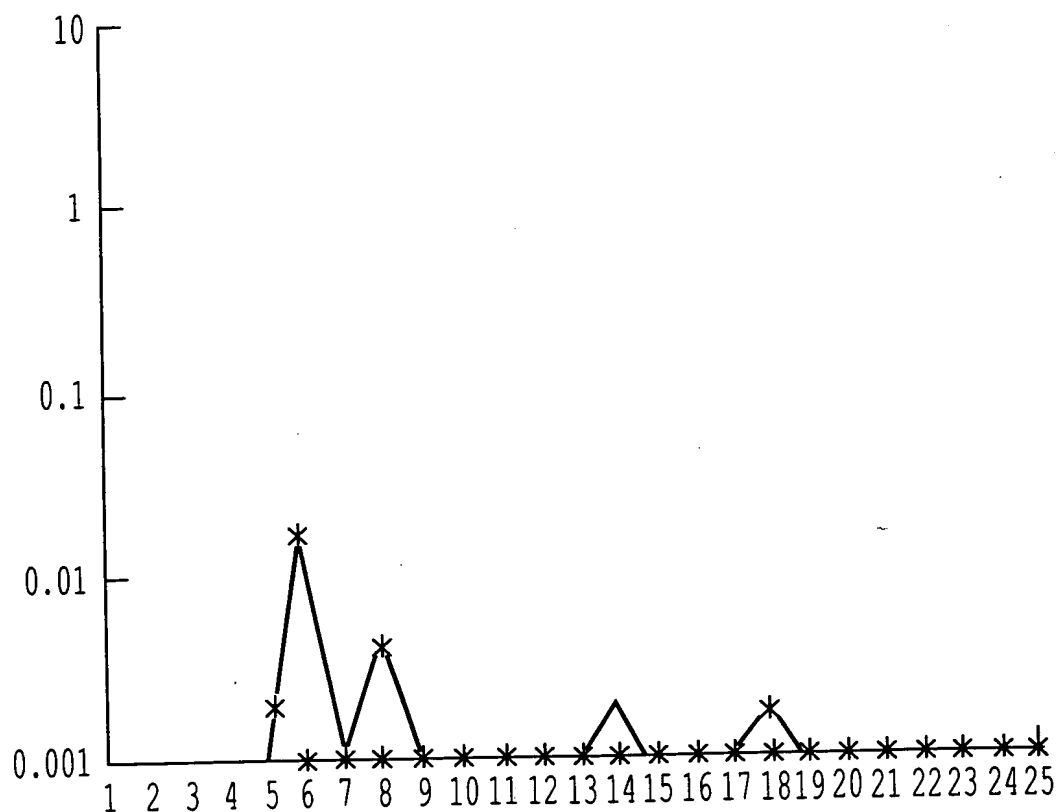
*FIG. 6C*



*FIG. 6D*



*FIG. 6E*



*FIG. 6F*

VACCINATION TEST: RECOMBINANT MSP-1 (P42 AND P19) FROM  
 PLASMODIUM CYNOMOLGI IN THE MACACA SINICA TOQUE MACAQUE

	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
YEAR	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
MONTH	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
DAY	19	20	21	22	23	24	25	26	27	28	29	30	31							
DAYS POST-INFECTION	5	6	7	8	9	10	11	12	13	14	15	16	17							
VACCINATION T434	-	.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p42	-	-	.002	.008	.02	.006	.01	.008	.008	.06	.02	.03	.002							
T428	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VACCINATION T429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
p19	-	-	.002	-	-	-	-	-	-	.002	-	-	-	-	-	-	-	-	-	-
T455	-	-	-	.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VACCINATION T430	-	.02	-	-	-	-	-	-	-	.002	-	-	-	-	-	-	-	-	-	-
p42+p19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.002
T433	.002	-	-	.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONTROLS	T425	.006	-	.05	0.1	.006	.002	.002	.006	.004	.03	.04	.03	.02	.03					
PHYSIOLOGICAL WATER	T436	-	-	.004	.008	0.05	0.1	0.09	0.39	0.4	0.3	0.1	0.09	0.1	.3					
FCA/FLAT	T438	.008	0.01	0.1	0.2	0.6	0.5	0.6	0.05	0.1	0.07	0.03	0.1	0.1	.32					
CONTROLS	T437	.004	.008	0.2	0.1	0.4	0.1	0.06	0.2	1.0	0.03	0.1	0.05	0.08	.17					
NON VACCINATED	T440	.006	.01	0.1	1.04	1.5	1.8	1.6	1.5	0.3	0.12	0.28	0.4	0.12	.12					
T441	.004	.008	0.2	0.8	2.1	2.1	1.7	3.8	1.04	0.27	0.1	1.5	0.9	0.9	.16					

- = ABSENCE OF PARASITES IN 400 MICROSCOPIC FIELDS

FIG. 6G.1

CONTINUED

TO

FIG. 6G.2

FIG. 6G.2

**FIG. 6G.2**



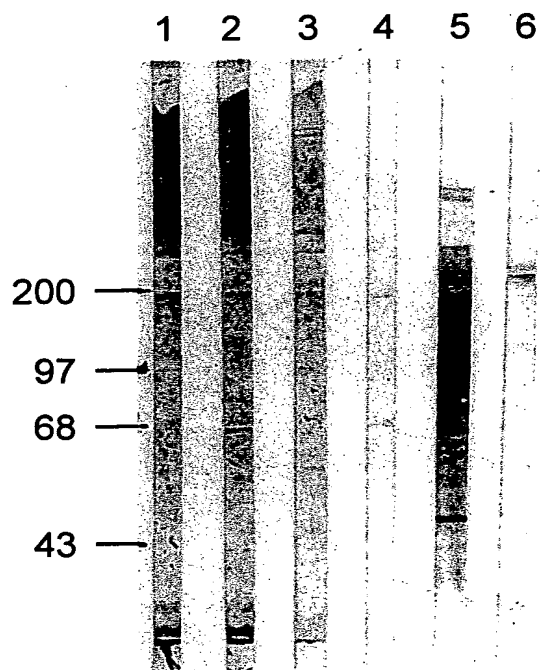


FIG.7A

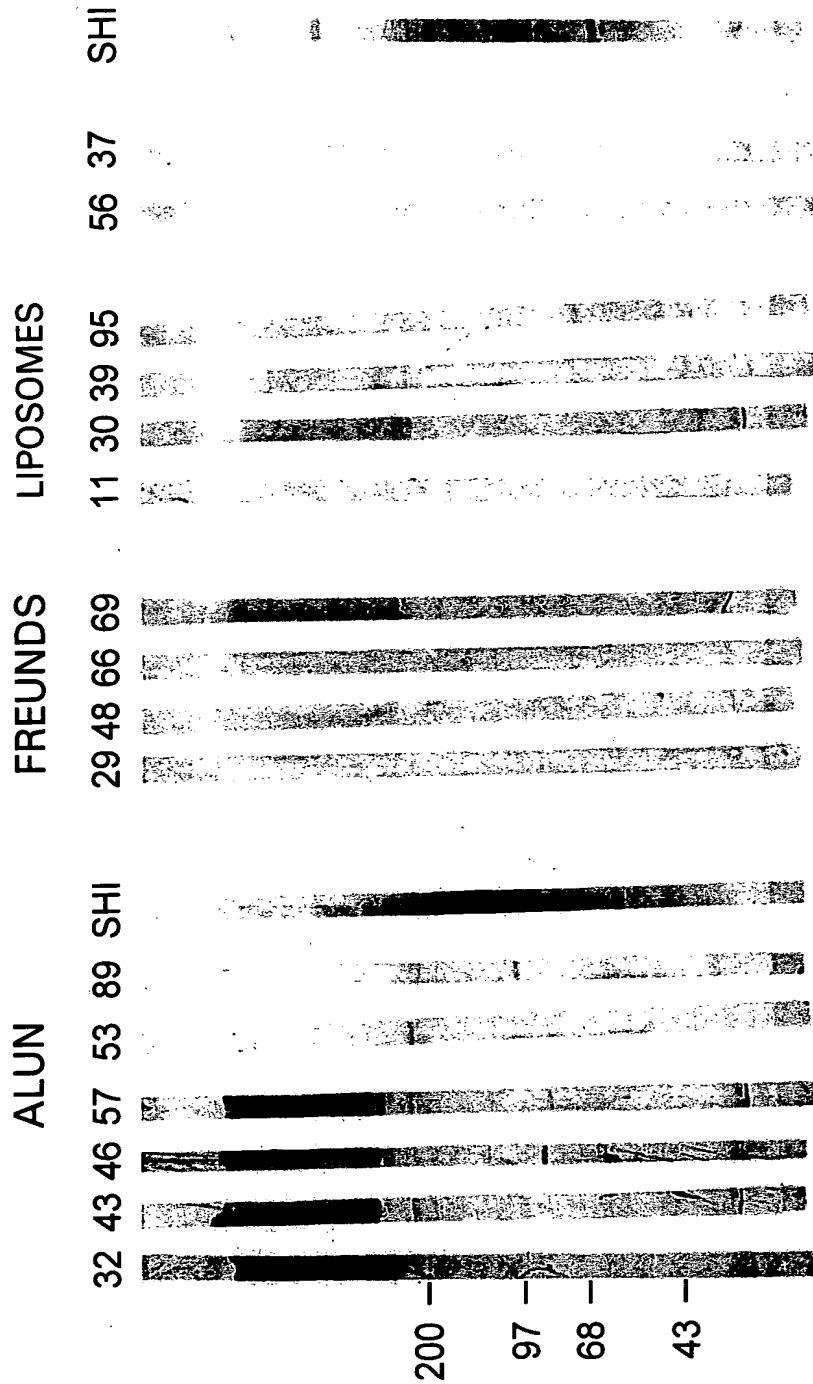
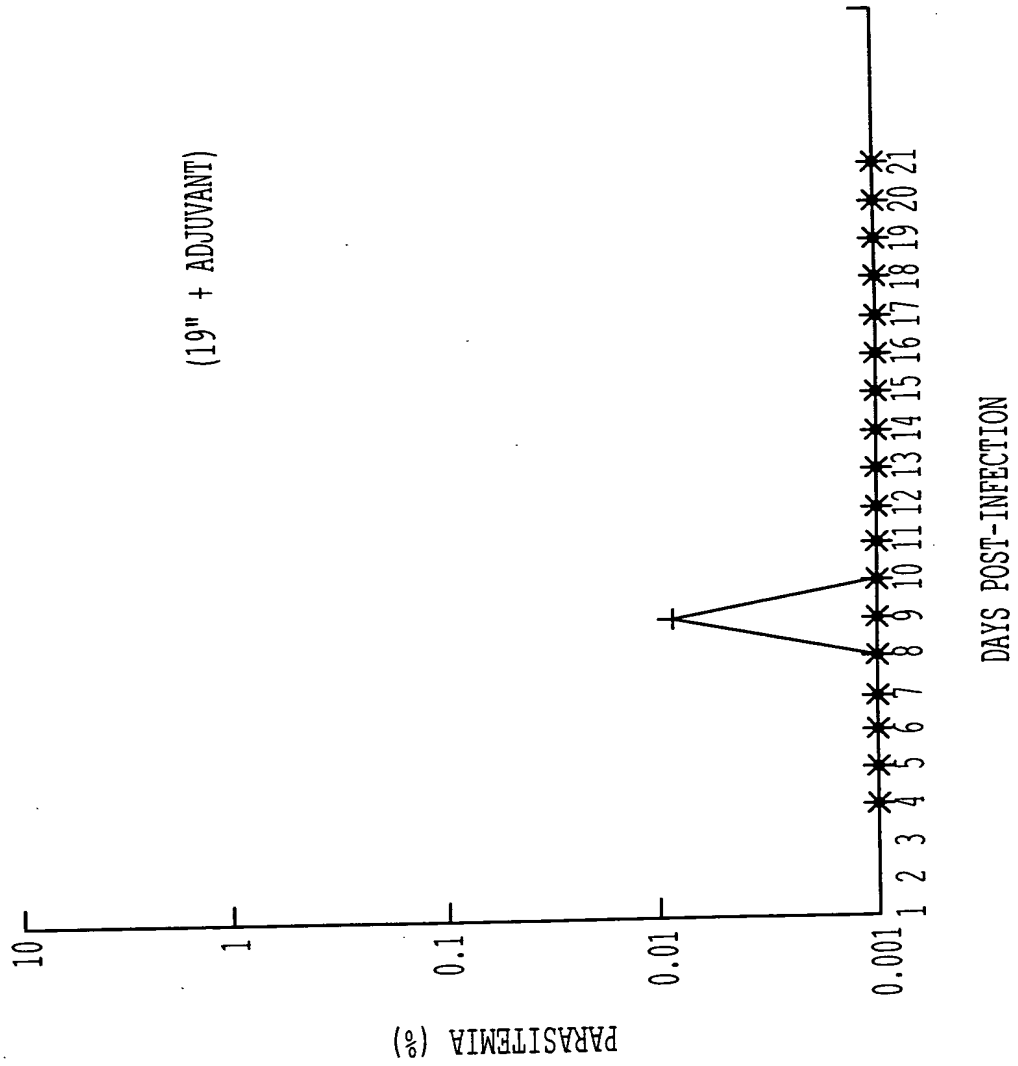
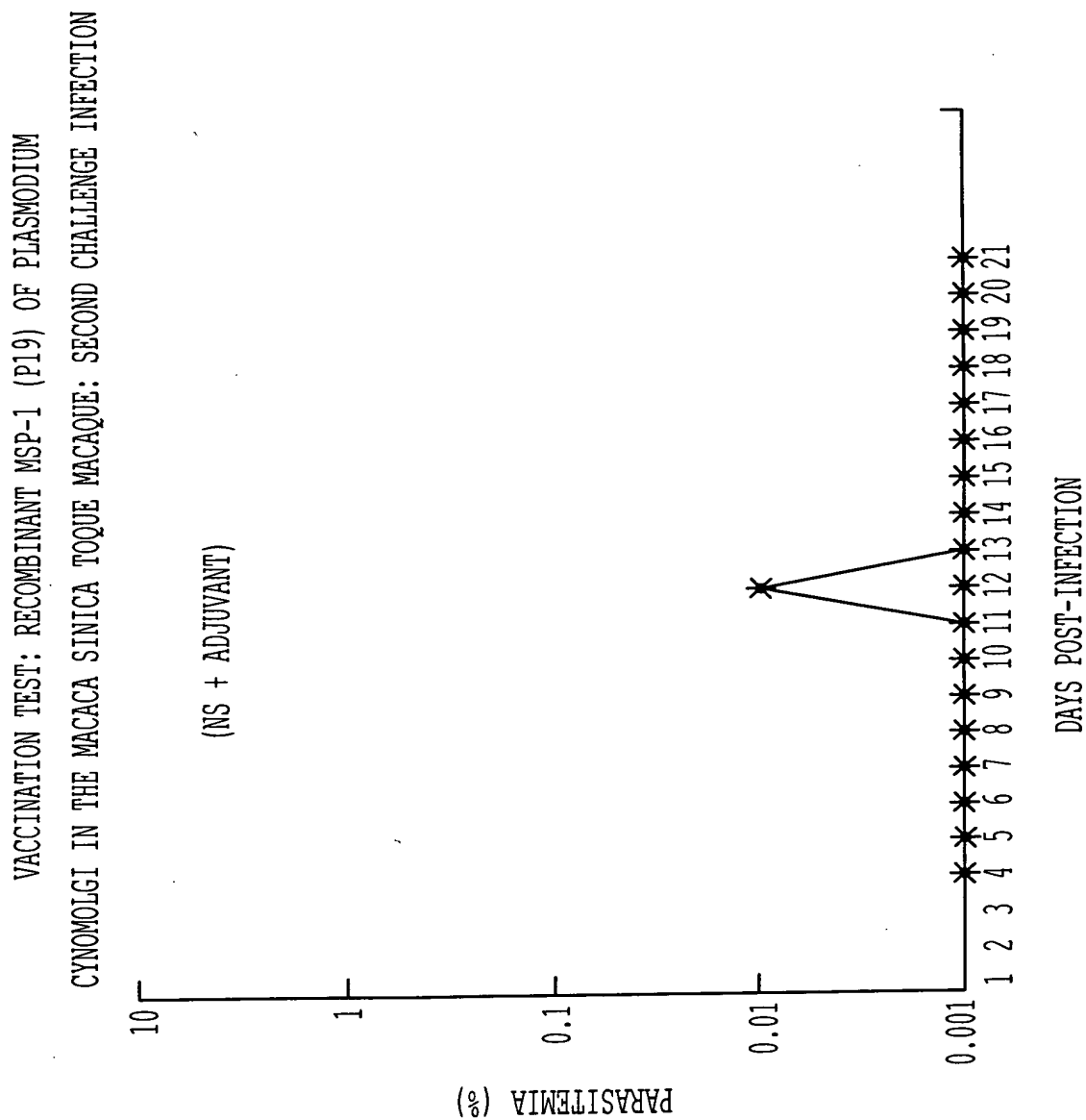


FIG. 7B

VACCINATION TEST: RECOMBINANT MSP-1 (P19) OF PLASMODIUM CYNOMOLGI IN  
THE MACACA SINICA TOQUE MACAQUE; SECOND CHALLENGE INFECTION



**FIG. 8A**



**FIG. 8B**

VACCINATION TEST: RECOMBINANT MSP-1 (P19) OF PLASMODIUM  
CYNOMOLGI IN THE MACACA SINICA TOQUE MACAQUE; SECOND CHALLENGE INFECTION

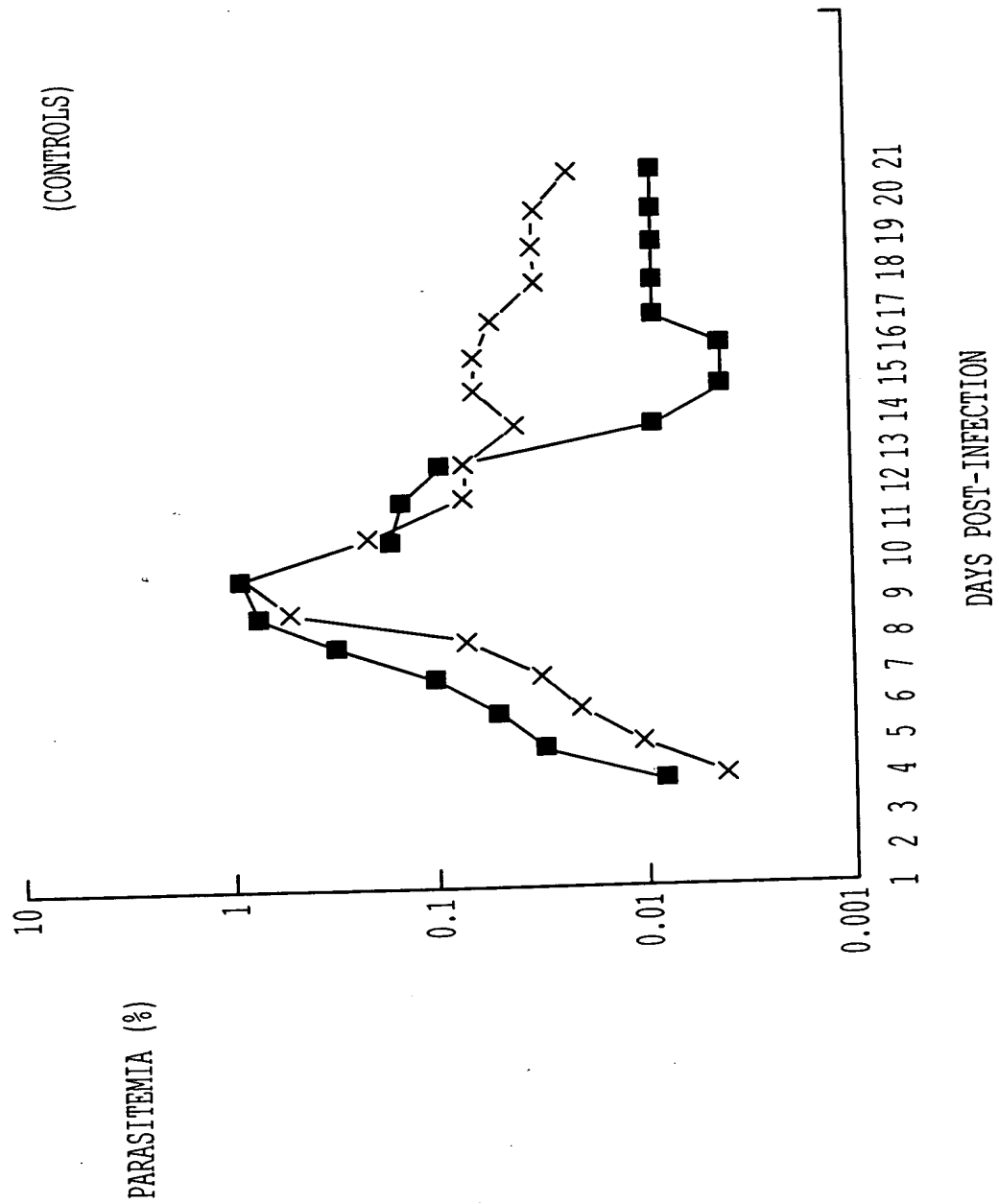


FIG. 8C

VACCINATION TEST: RECOMBINANT MSP-1 (p19) OF PLASMODIUM  
CYNOMOLGI IN THE MACACA SINICA TOQUE MACAQUE; SECOND CHALLENGE INFECTION

YEAR	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
MONTH	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
DAYS POST-INFECTION	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21
DAYS AFTER CHALLENGE	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21	21
VACCINATION p19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T427	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T429	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONTROLS																				
PHYSIOLOGICAL WATER																				
FCA/FLA																				
T436	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T425	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T438	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CONTROLS																				
NON VACCINATED																				
T448	.008	.03	.05	.01	.03	.07	.05	.07	.14	.09	.008	.004	.004	.008	.008	.008	.008	.008	.008	.008
T449	.004	.01	.02	.03	.07	.07	.05	.08	.02	.07	.04	.06	.06	.05	.03	.03	.03	.03	.03	.02

- = ABSENCE OF PARASITES IN 400 MICROSCOPIC FIELDS

FIG. 8D

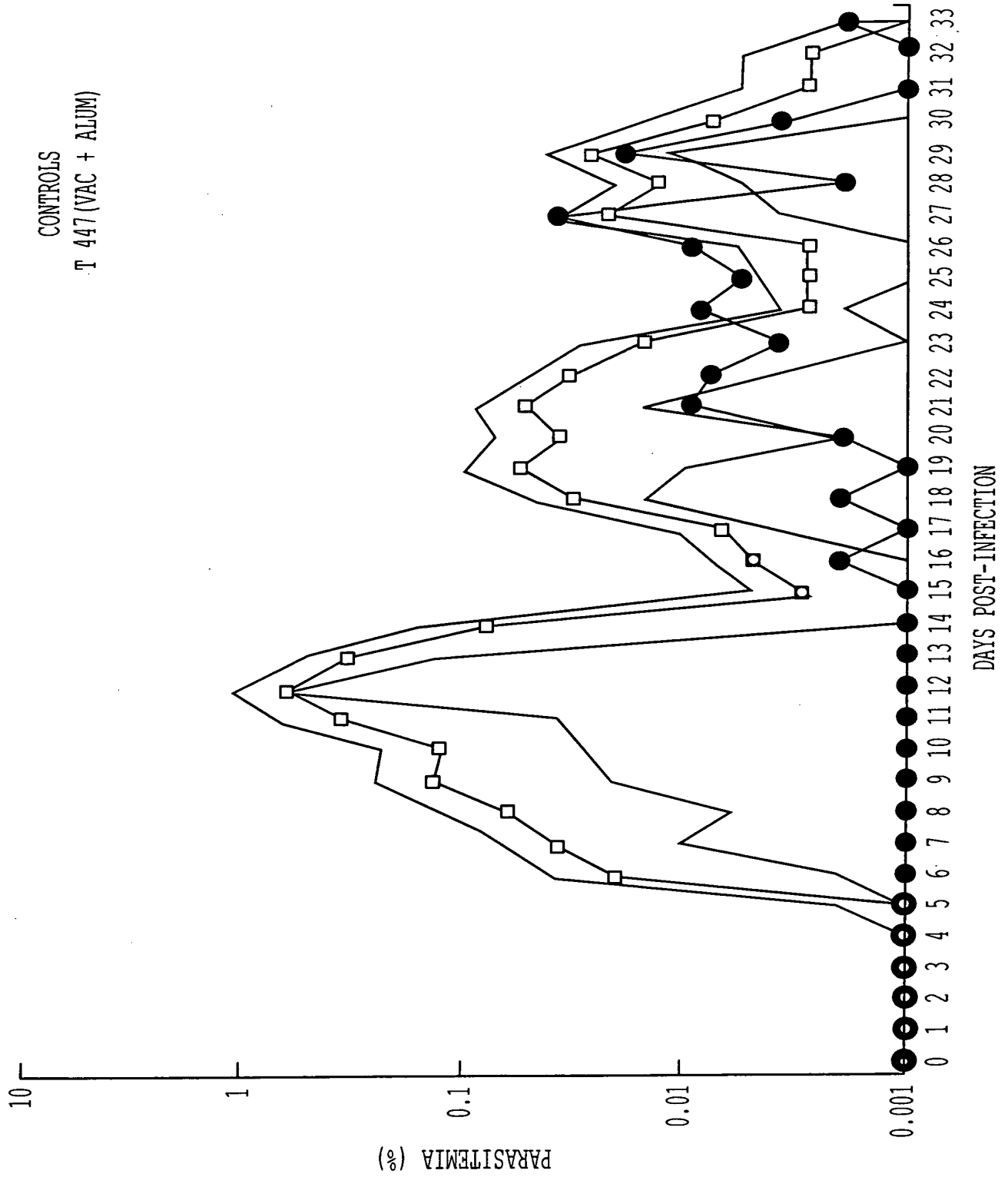


FIG. 9A

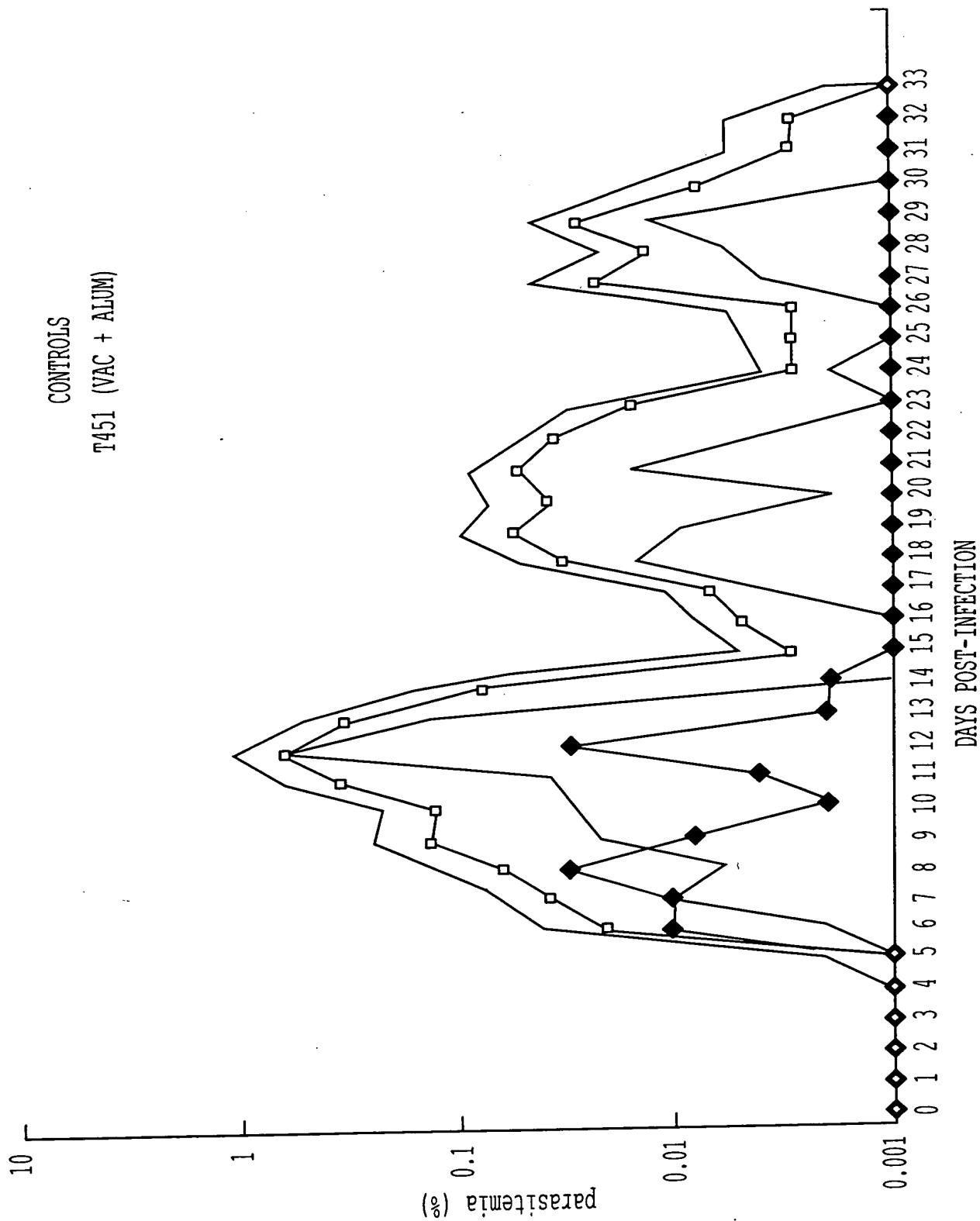


FIG. 9B



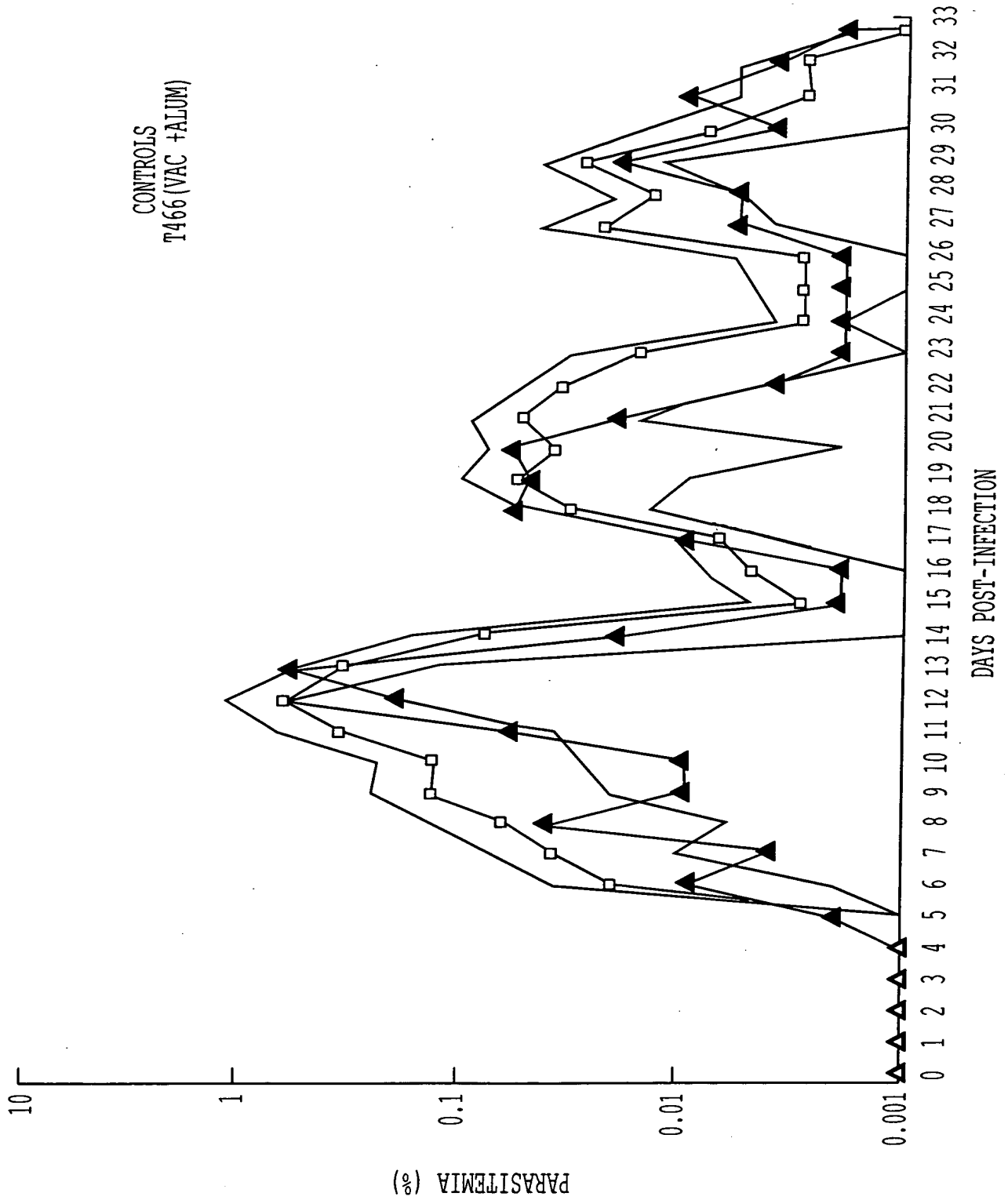


FIG. 9C

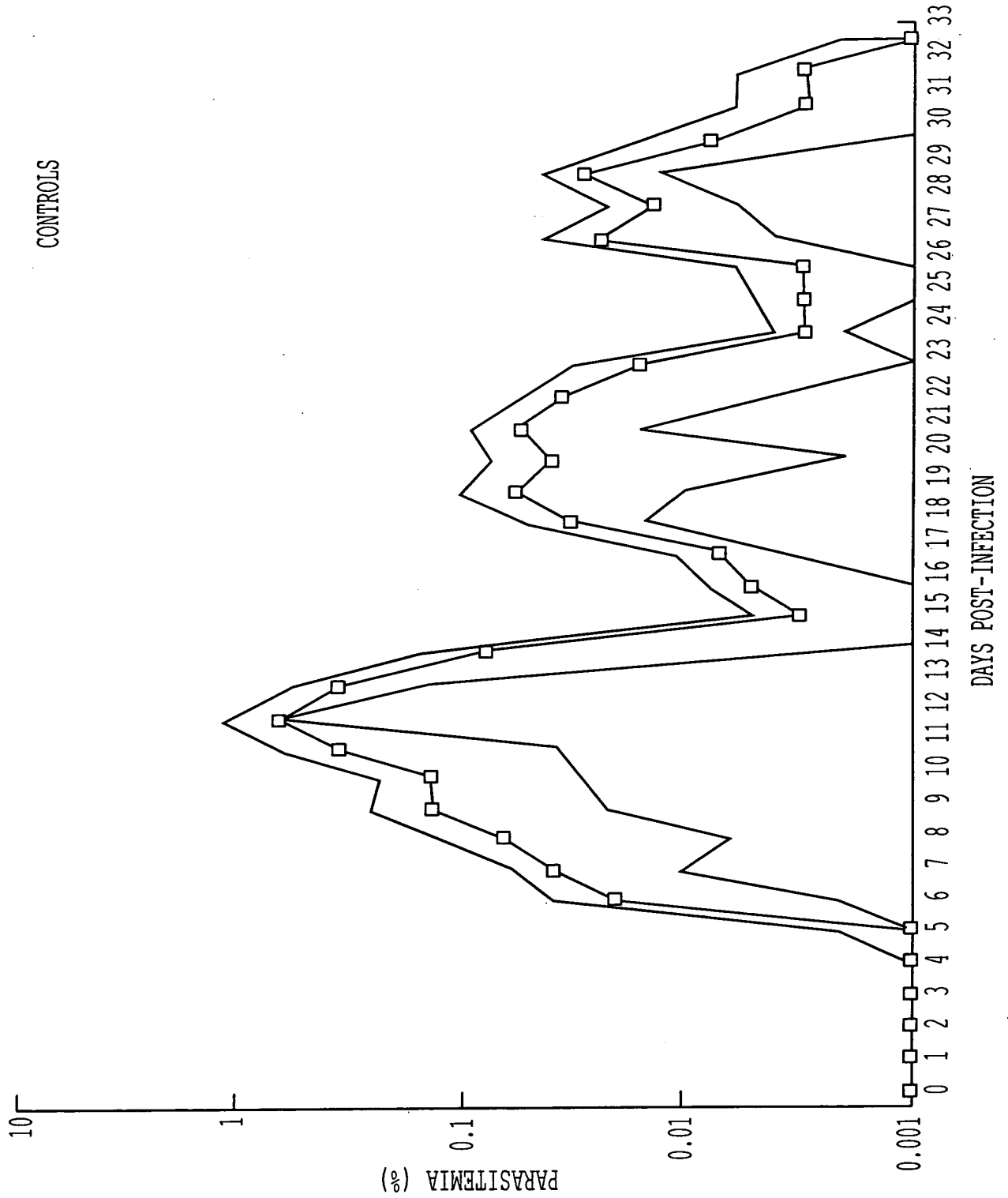


FIG. 9D

VACCINATION TEST: P. CYNOMOLGI/TOQUE MACAQUE WITH MSP-1 P19 OF P.

CYNOMOLGI IN ALUM

YEAR	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96
MONTH	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
DAY	17	18	19	20	21	22	23	24	25	26	27	28			
	5	6	7	8	9	10	11	12	13	14	15	16			

GROUP 1

(19" + ALUM)

T446	0.002	0.009	0.004	0.04	0.01	0.01	0.06	0.2	0.6	0.02	0.002	0.002			
T447	-	-	-	-	-	-	-	-	-	-	-	-	0.002		
T450	-	0.01	0.01	0.01	0.006	0.002	0.004	0.03	0.002	0.002	-	-	-		

GROUP 2

(NS + ALUM)

T450	0.002	0.01	0.05	0.04	0.12	0.04	0.12	0.2	0.12	0.02	0.006	0.01			
T454	0.002	0.05	0.06	0.14	0.3	0.28	0.08	13	0.063	0.02	0.002	0.002			
T455	-	-	-	0.008	0.05	0.08	0.14	0.4	0.3	0.2	0.002	0.002			

- NEGATIVE FOR PARASITES IN 400 MICROSCOPIC FIELDS

CONTINUED ON  
TO FIG 9E.2

FIG. 9E.1

**FIG. 9E.2**

PLASMODIU FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY  
MSP-1p19 VACCINATION WITH ALUM

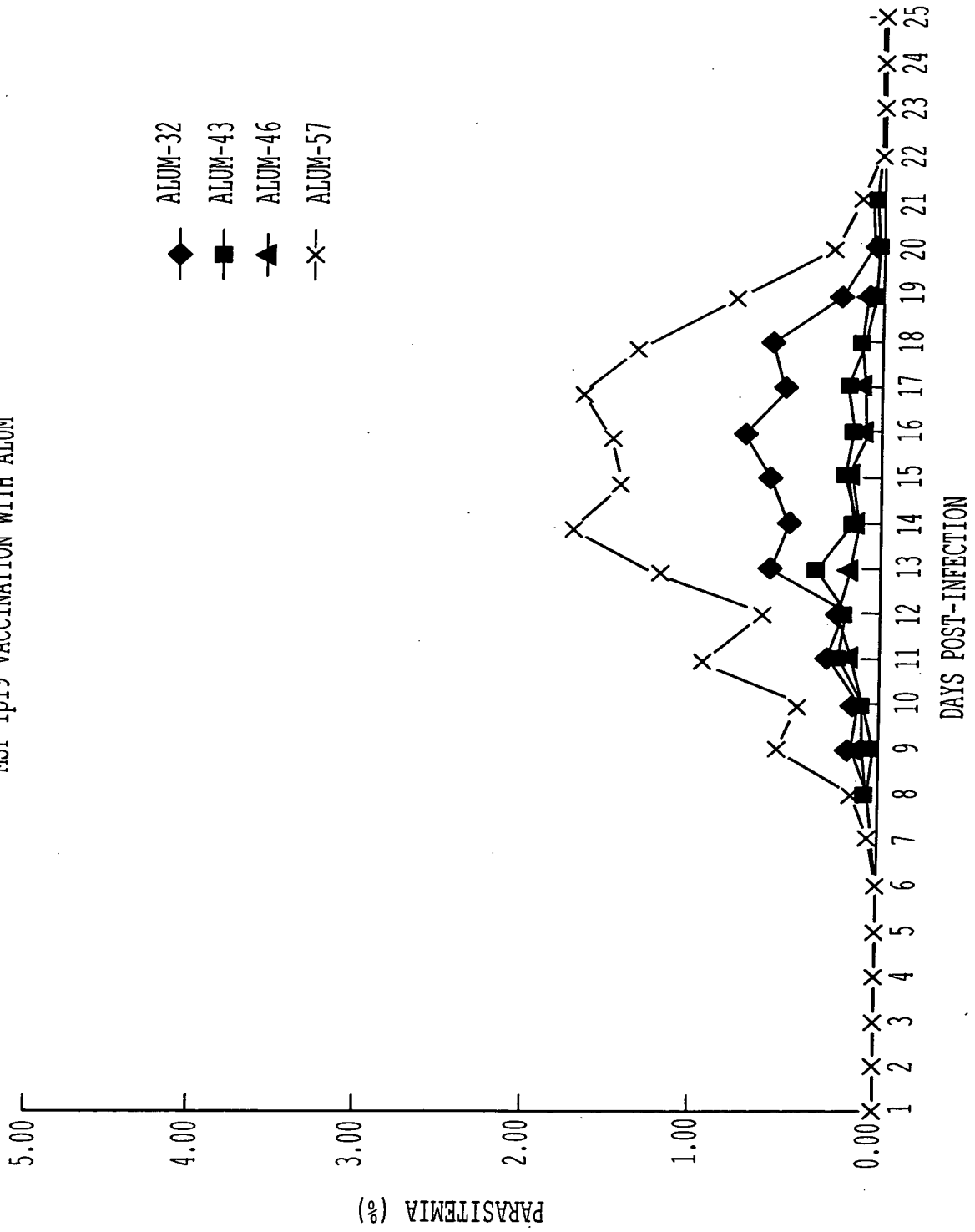


FIG. 10A

PLASMODIUM FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY

MSP-1 p19 VACCINATION WITH FREUNDS

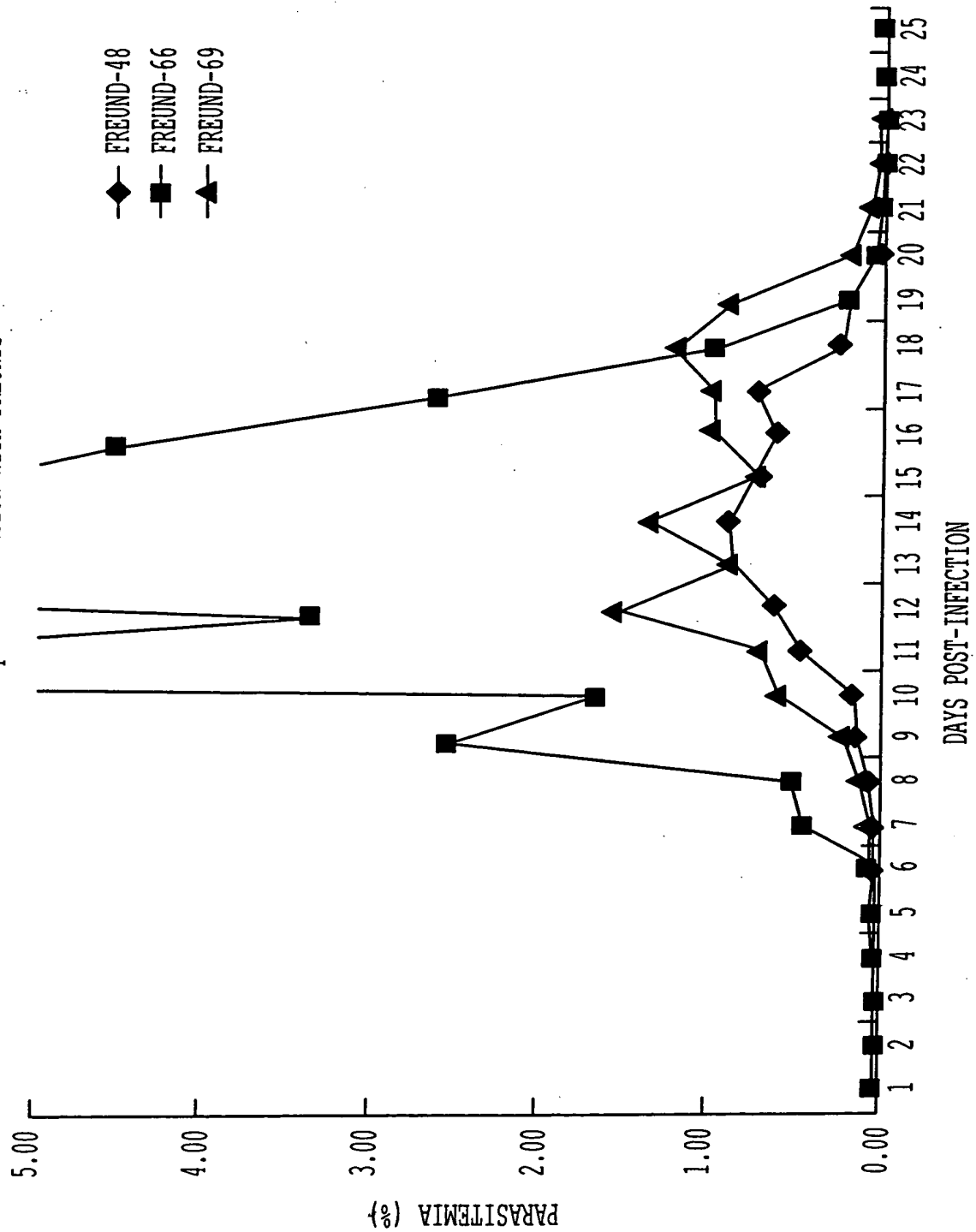


FIG. 10B

PLASMODIU FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY  
MSP-1 p19 VACCINATION WITH LIPOSOMES

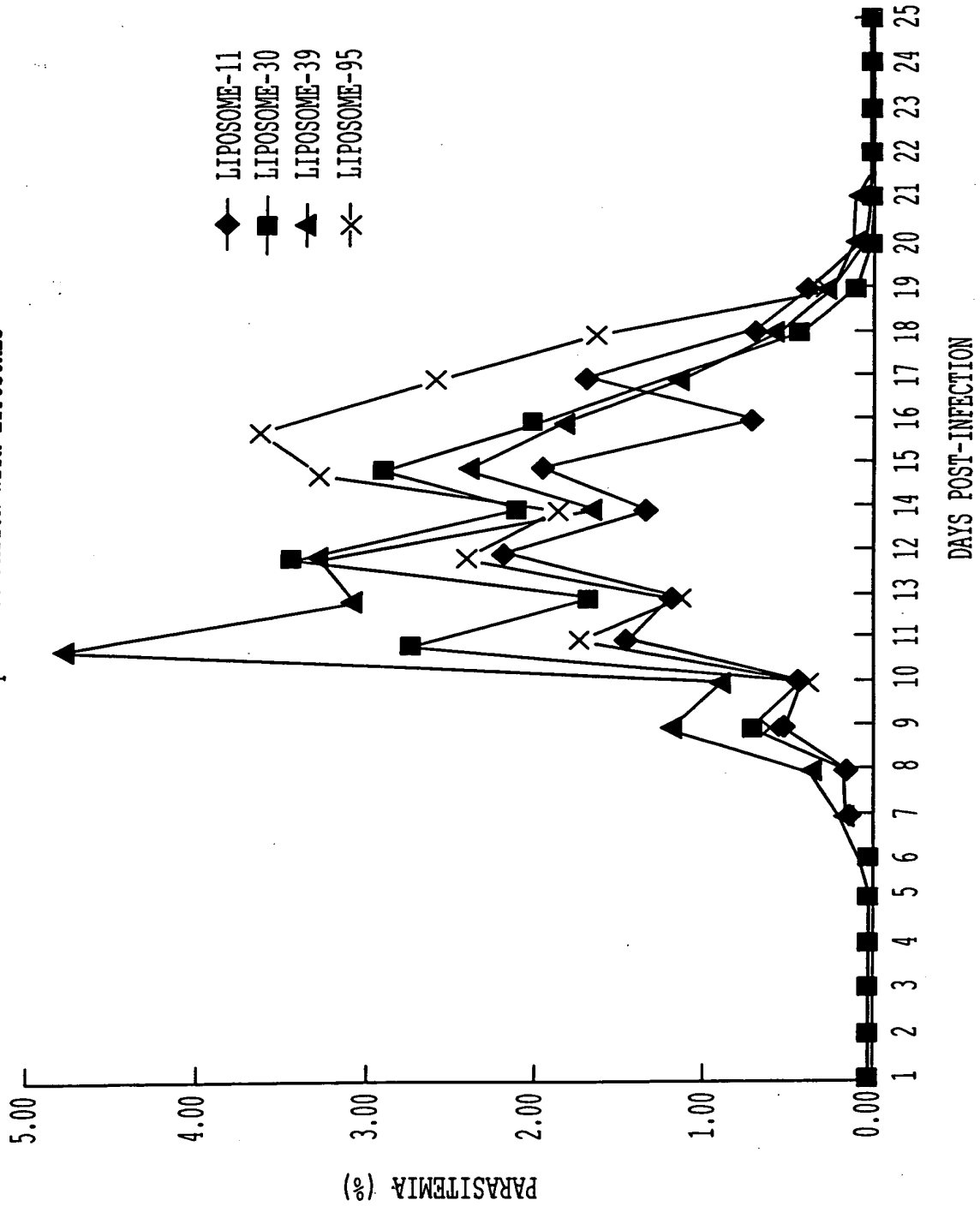


FIG. 10C

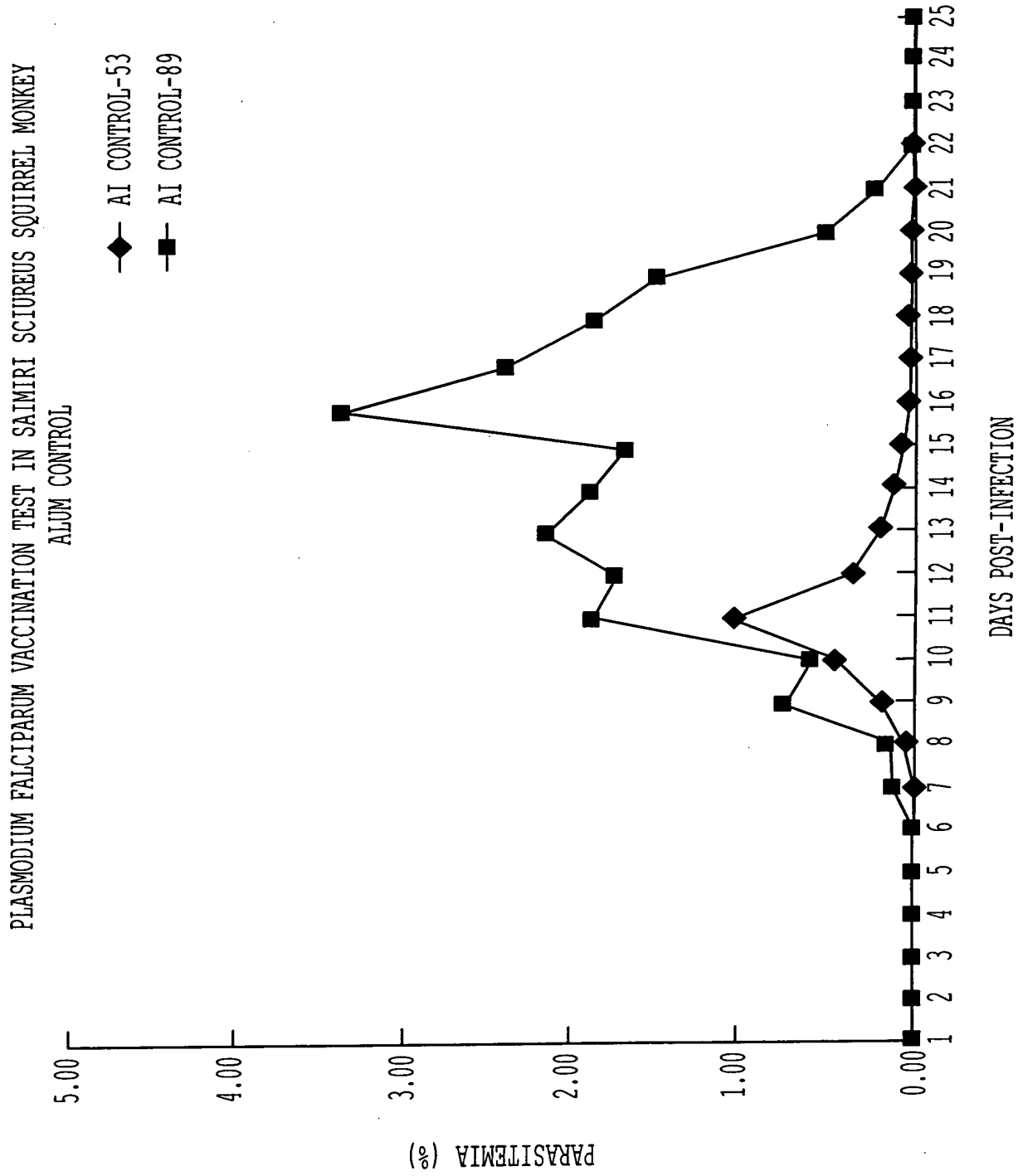


FIG. 10D



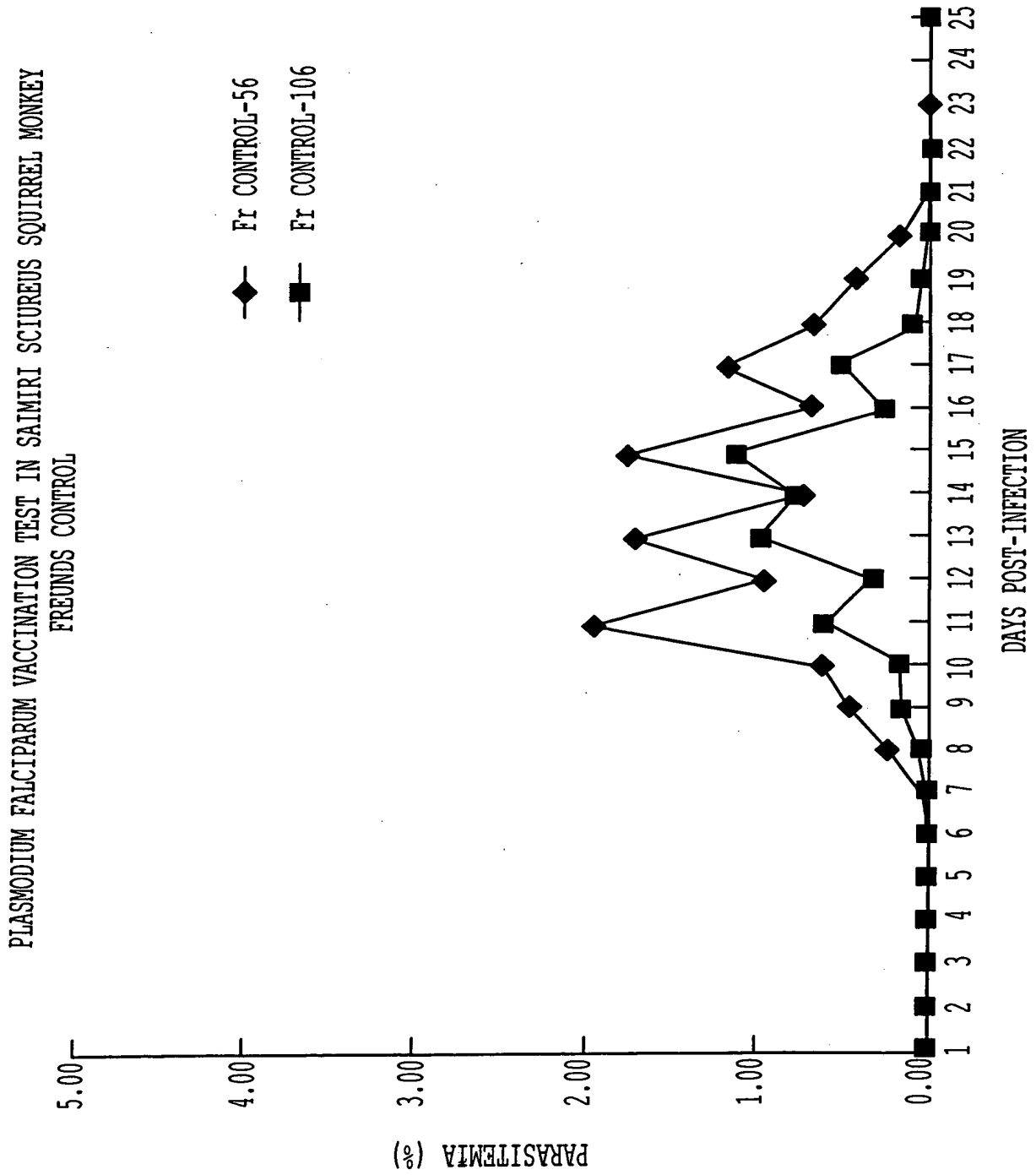


FIG. 10E

PLASMODIUM FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY

LIPOSOME CONTROL

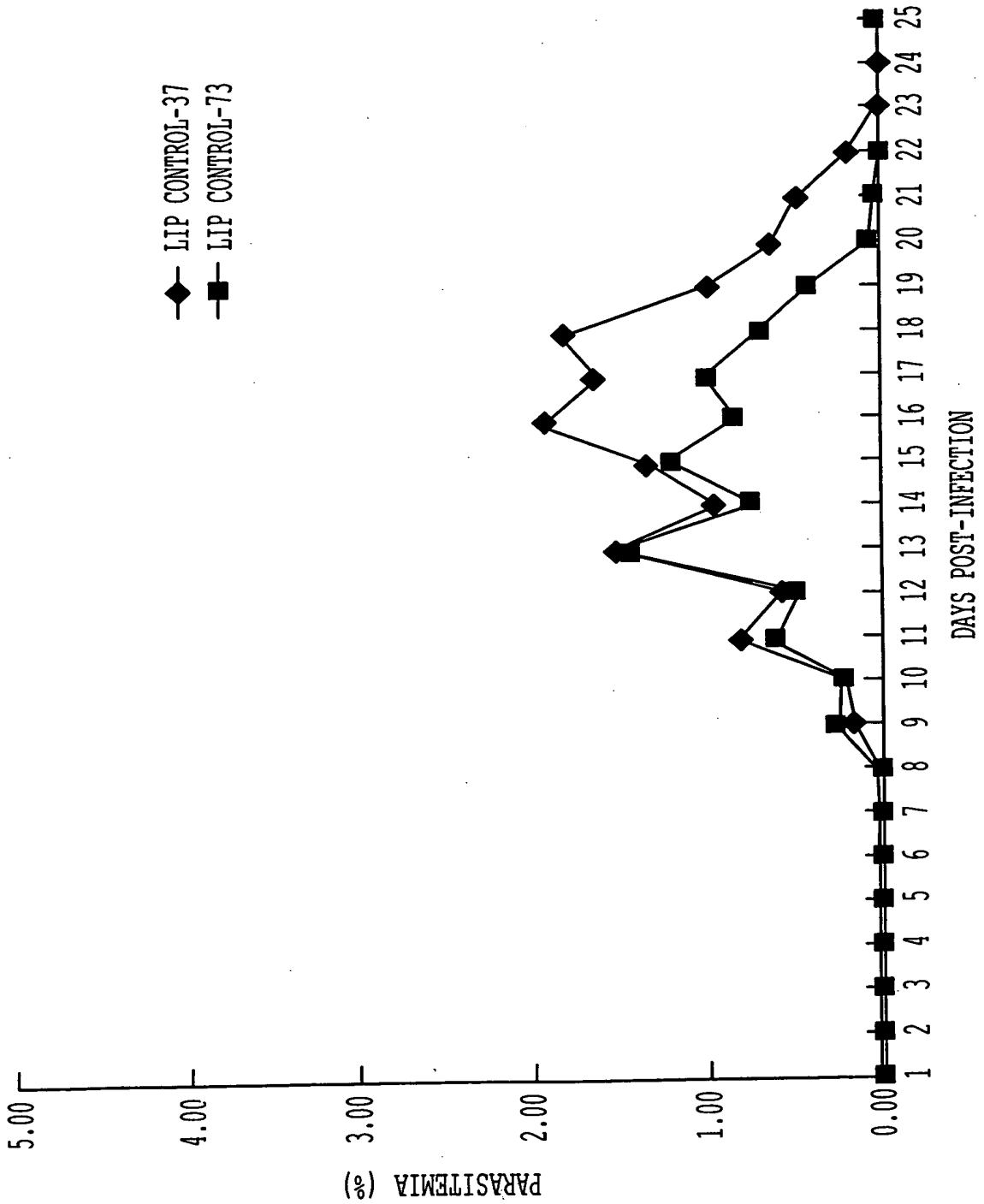


FIG. 10F

PLASMODIUM FALCIPARUM VACCINATION TEST IN SAIMIRI SCIUREUS SQUIRREL MONKEY

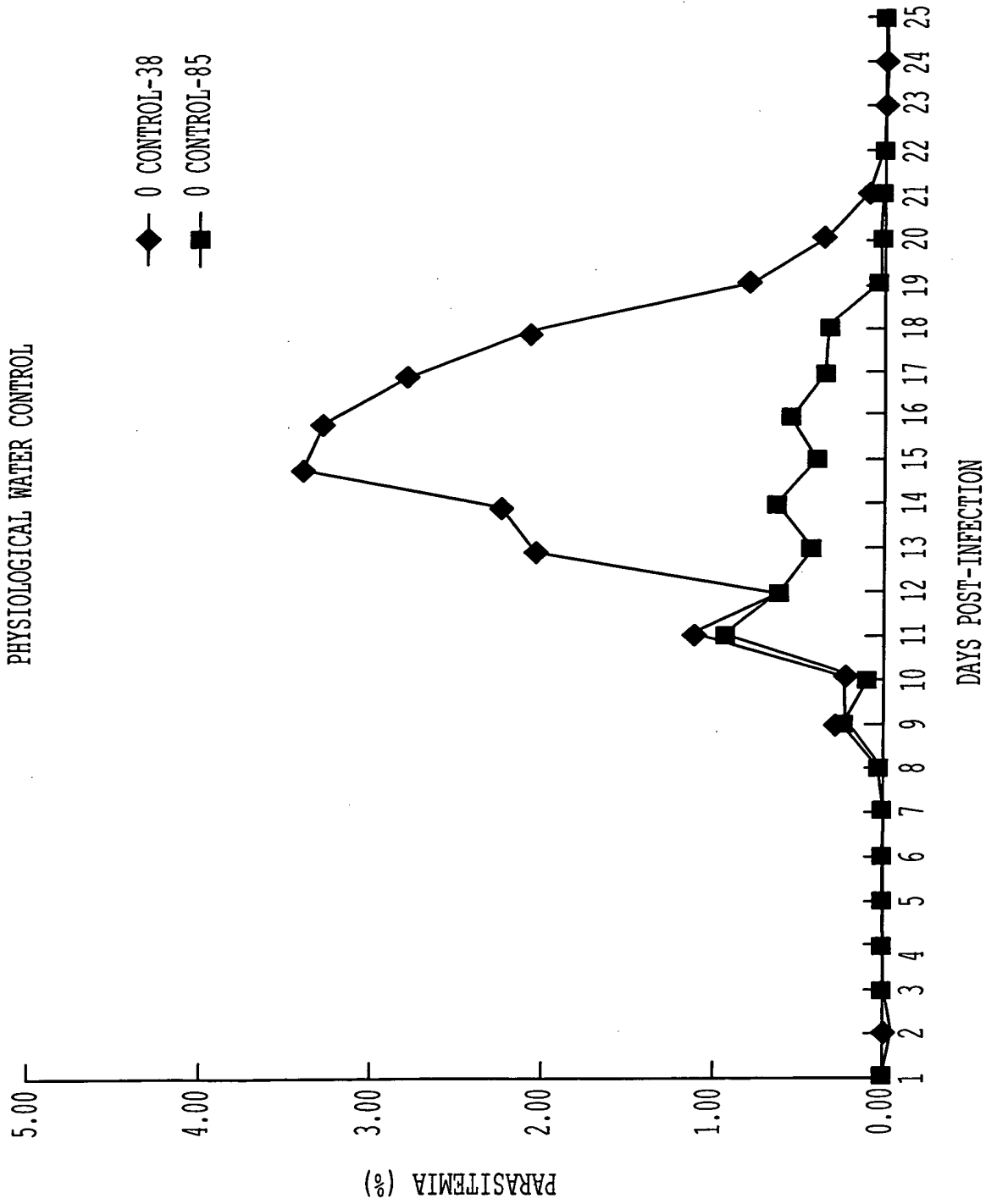
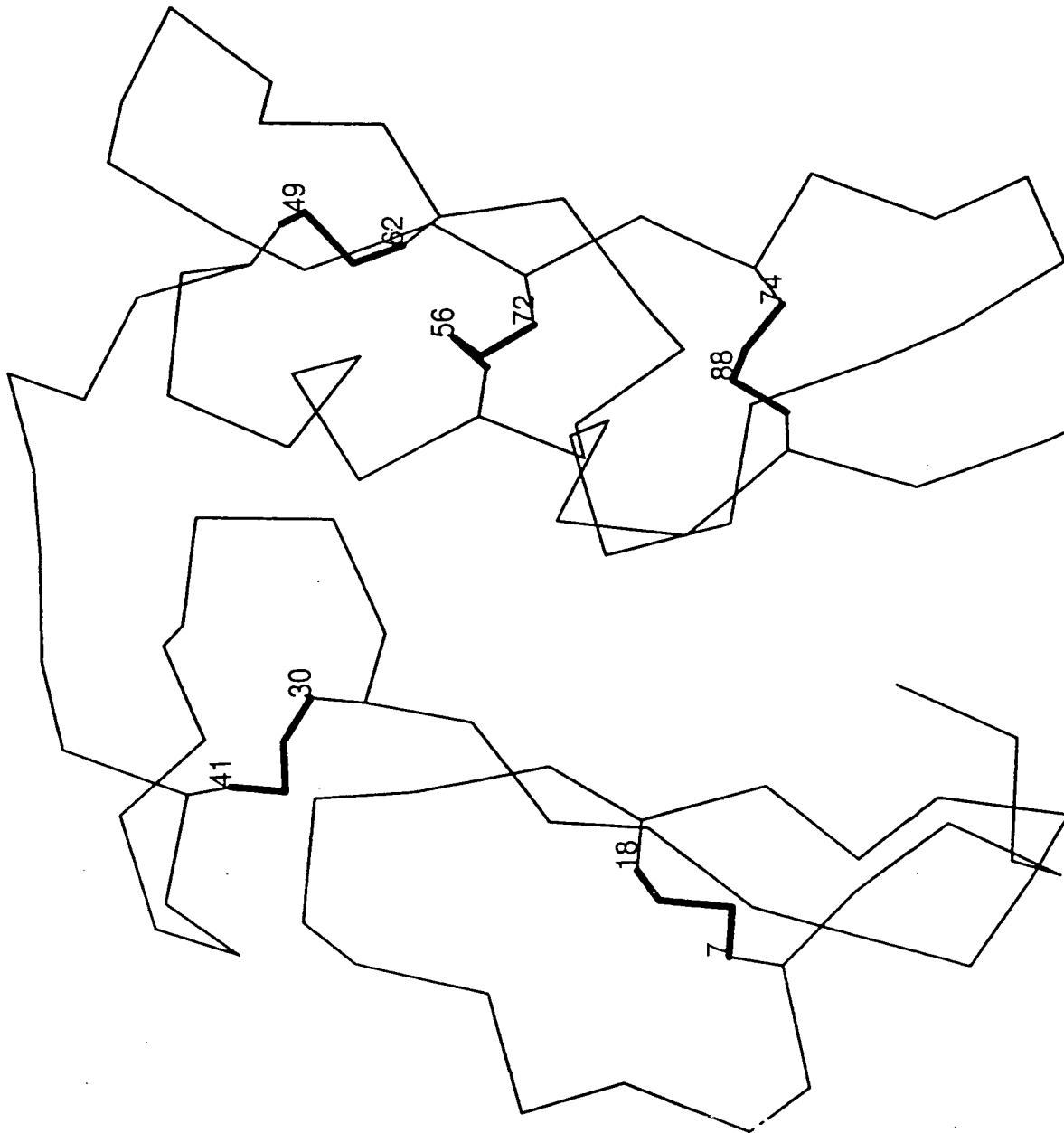
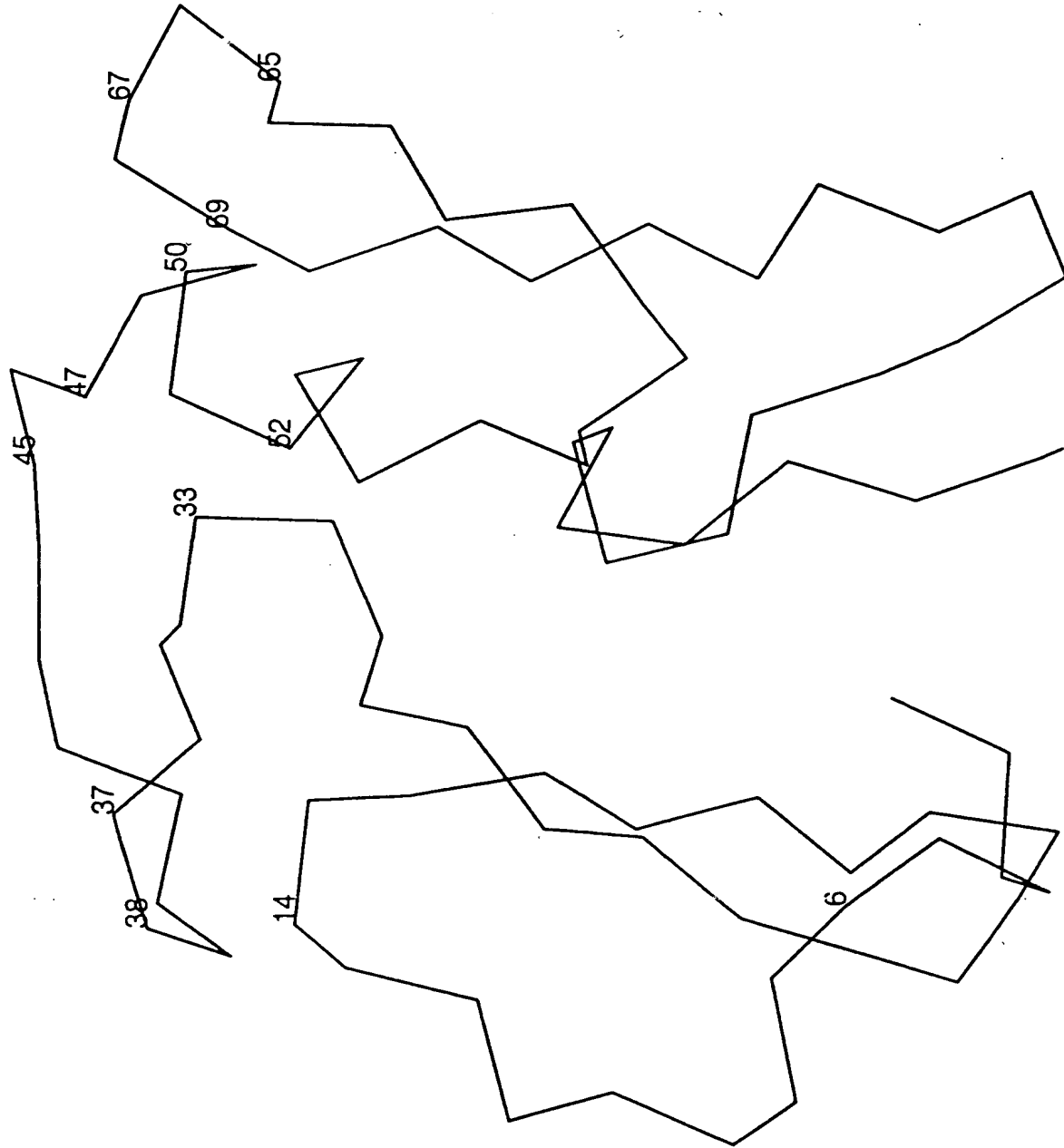


FIG. 10G

**FIG. 11A**

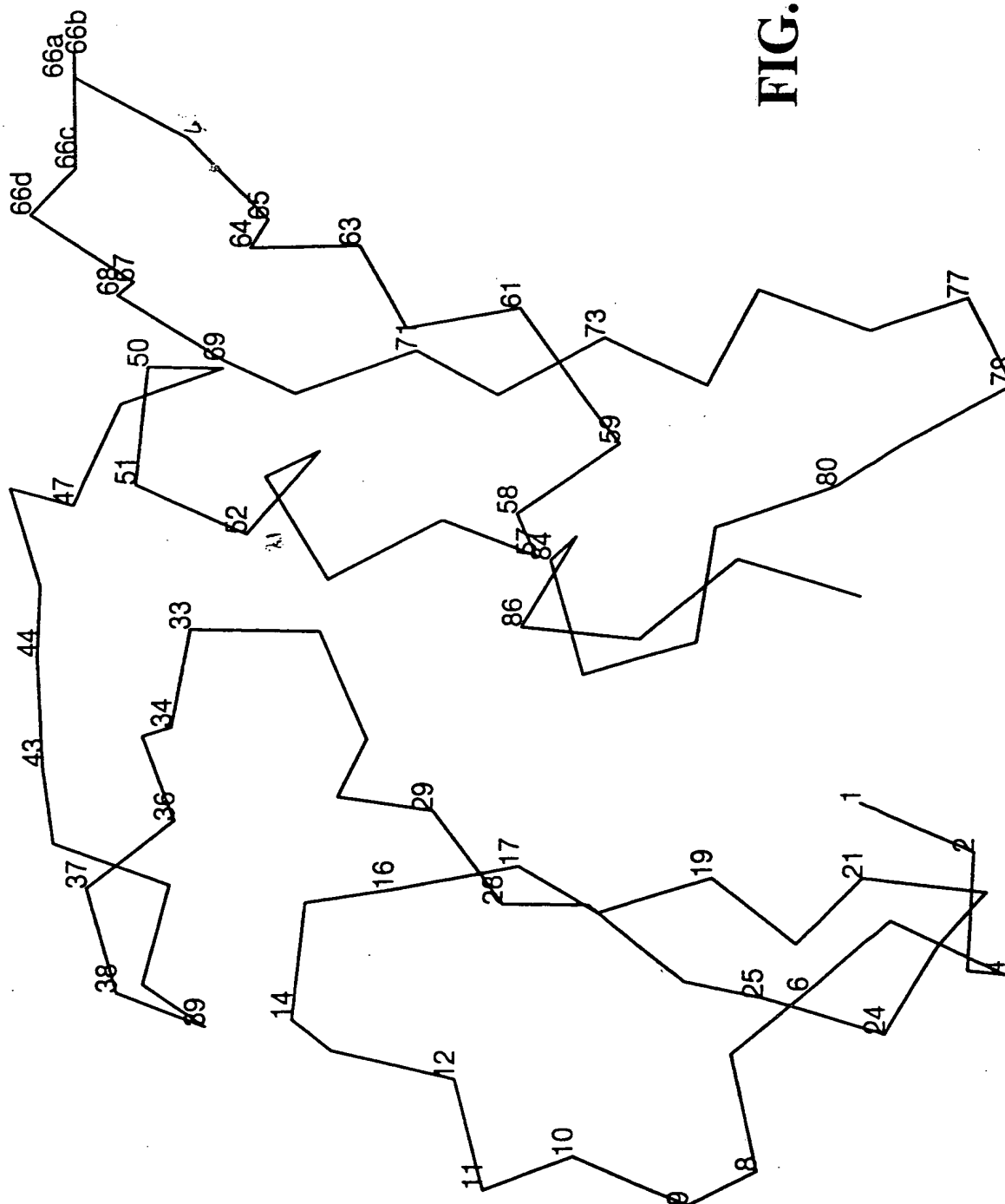


Backbone of MSP1(19) showing disulfide bridges in bold line



**FIG. 11B**

Backbone of MSP1(19) showing positions of sequence differences between *P. cynomolgi* and *P. vivax*.



**FIG. 11C**

Backbone of homology-modelled MSP1(19) of *P. falciparum* with positions of sequence differences with *P. cynomolgi*

(RECONSTRUCTED MASS SPECTRA P. CYNOMOLGI)

1.03e7 cps

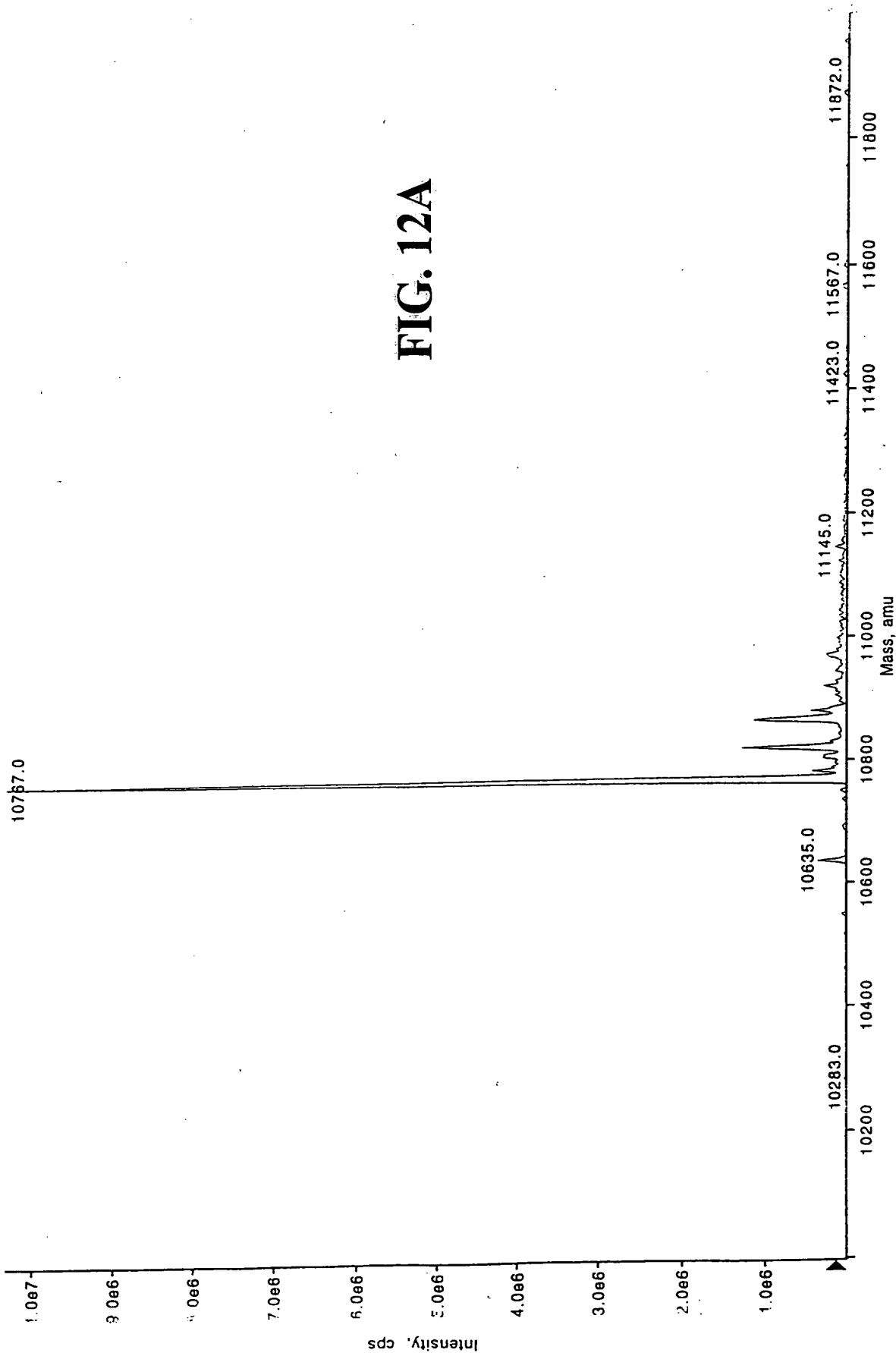
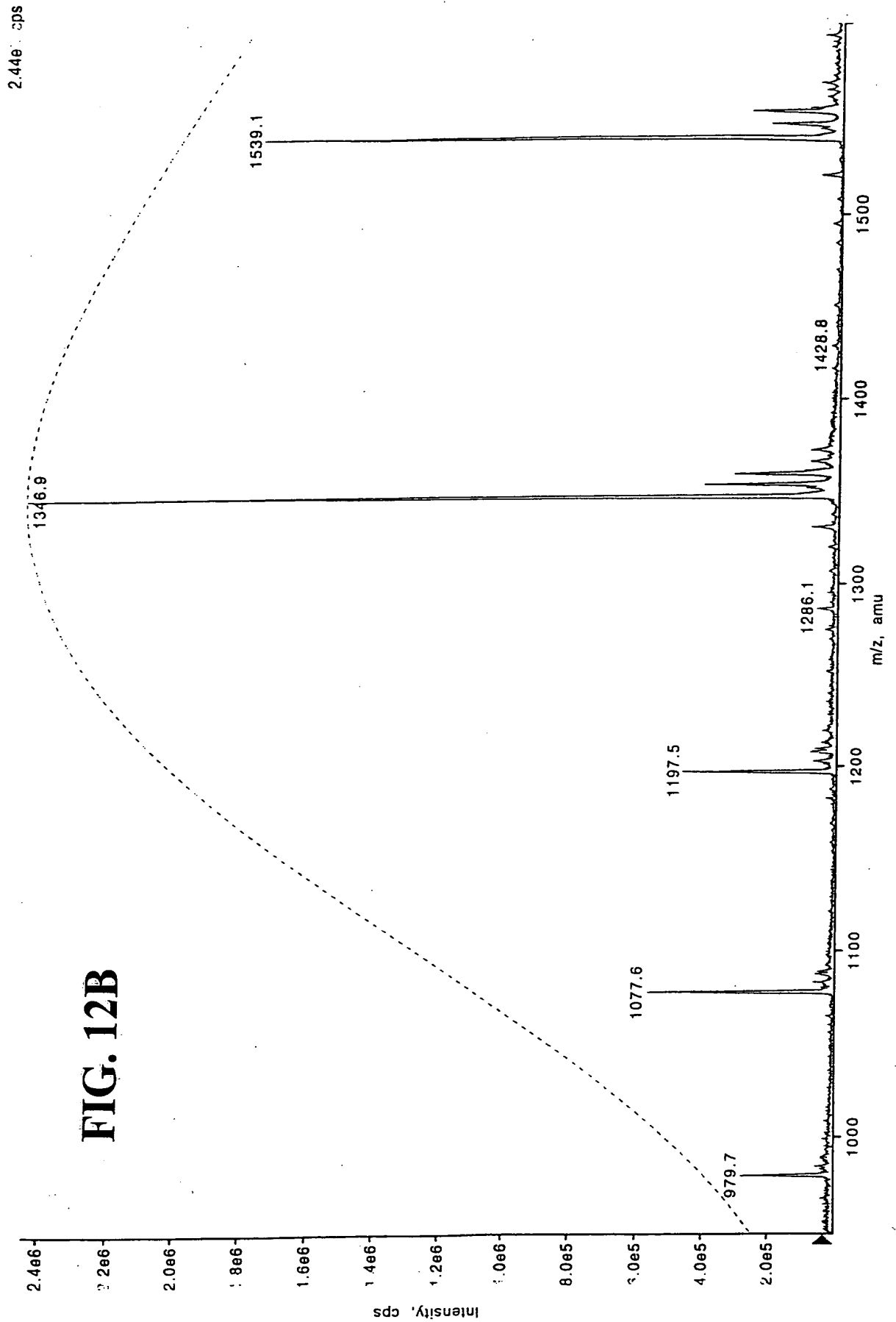


FIG. 12A

(m/z SPECTRA P. CYNOMOLGI)

FIG. 12B





(RECONSTRUCTED MASS SPECTRA P. FLACIPARUM)

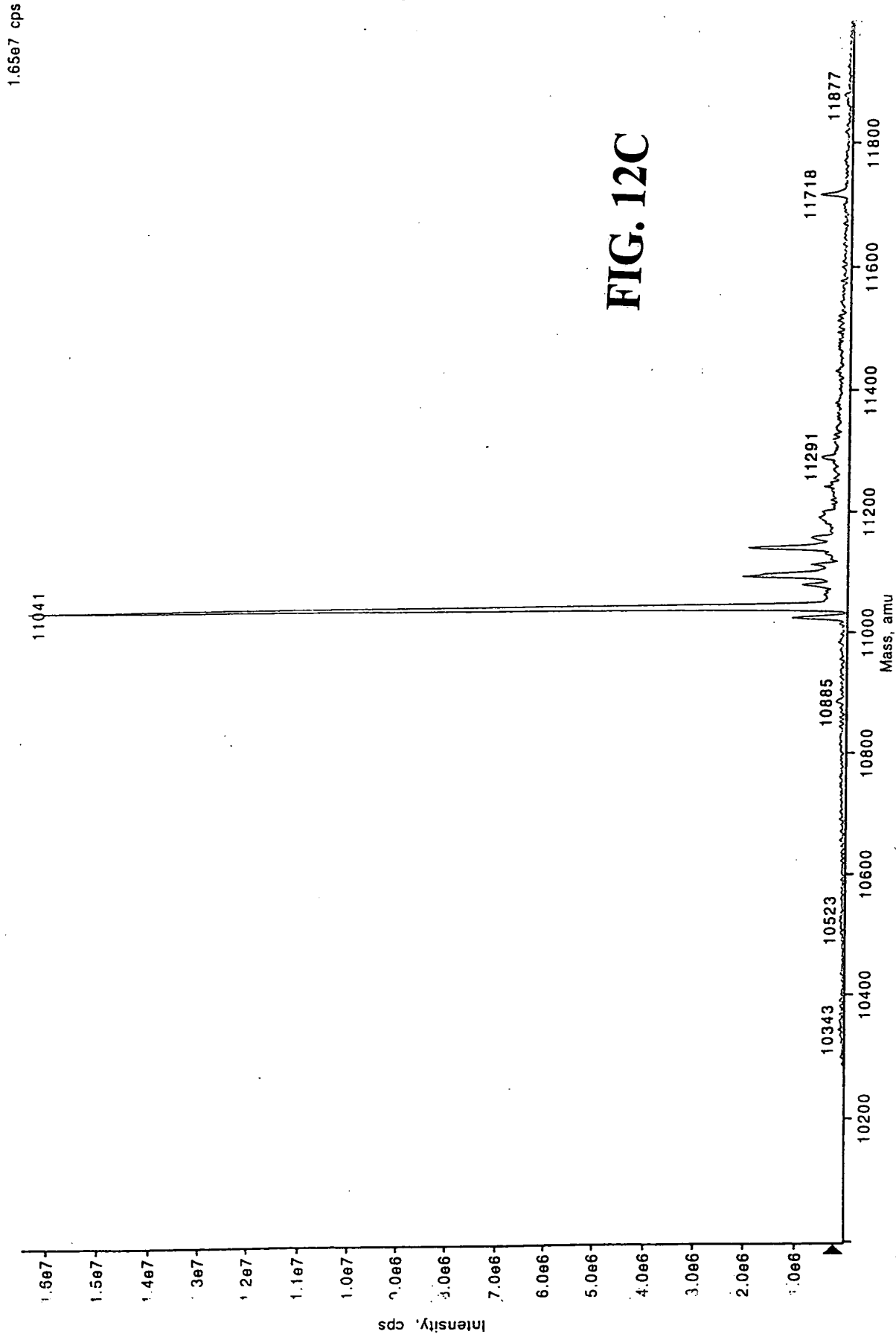
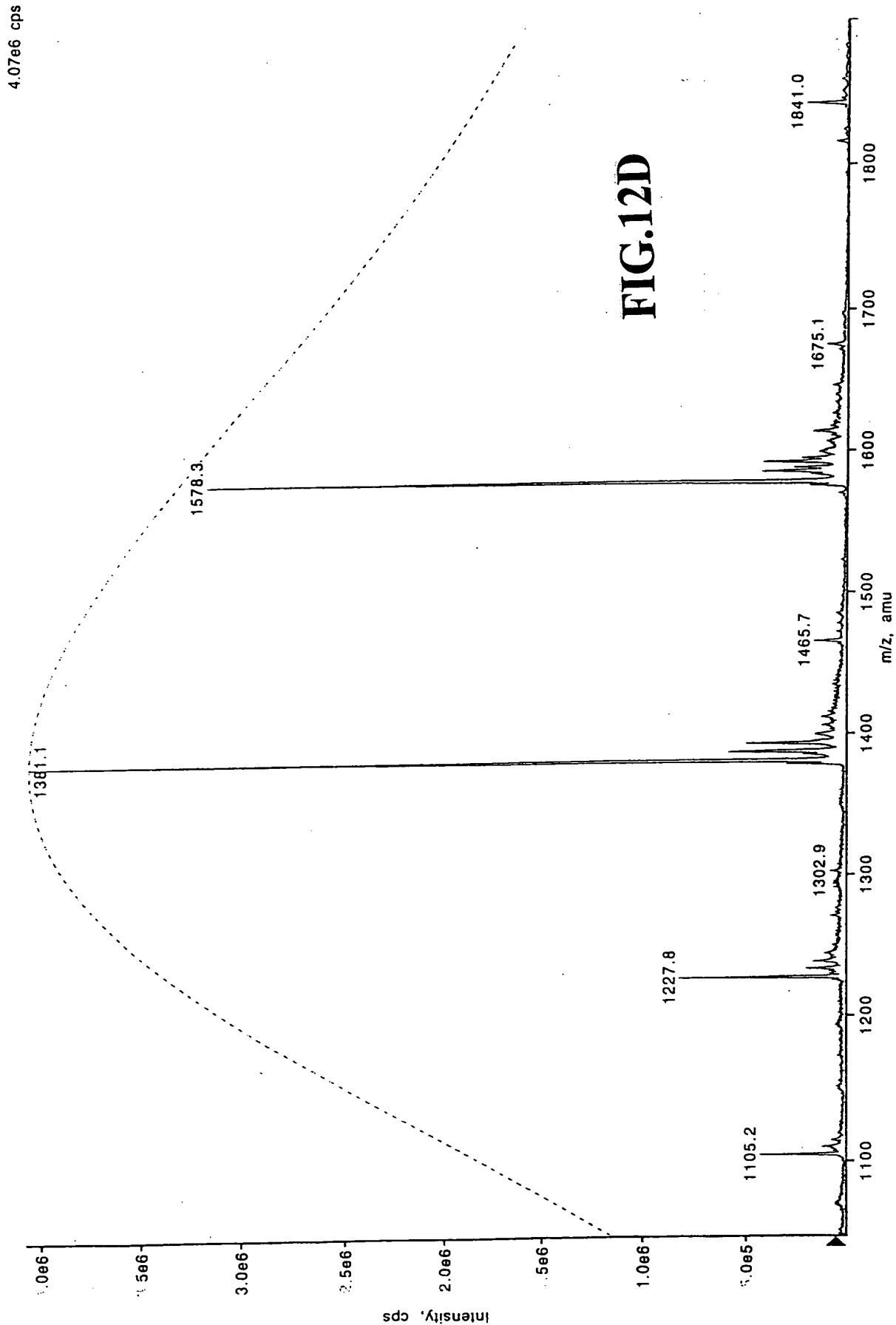


FIG. 12C

(m/z SPECTRA P. FALCIPARUM)



(RECONSTRUCTED MASS SPECTRA P.VIVAX)

1.97e7 cps

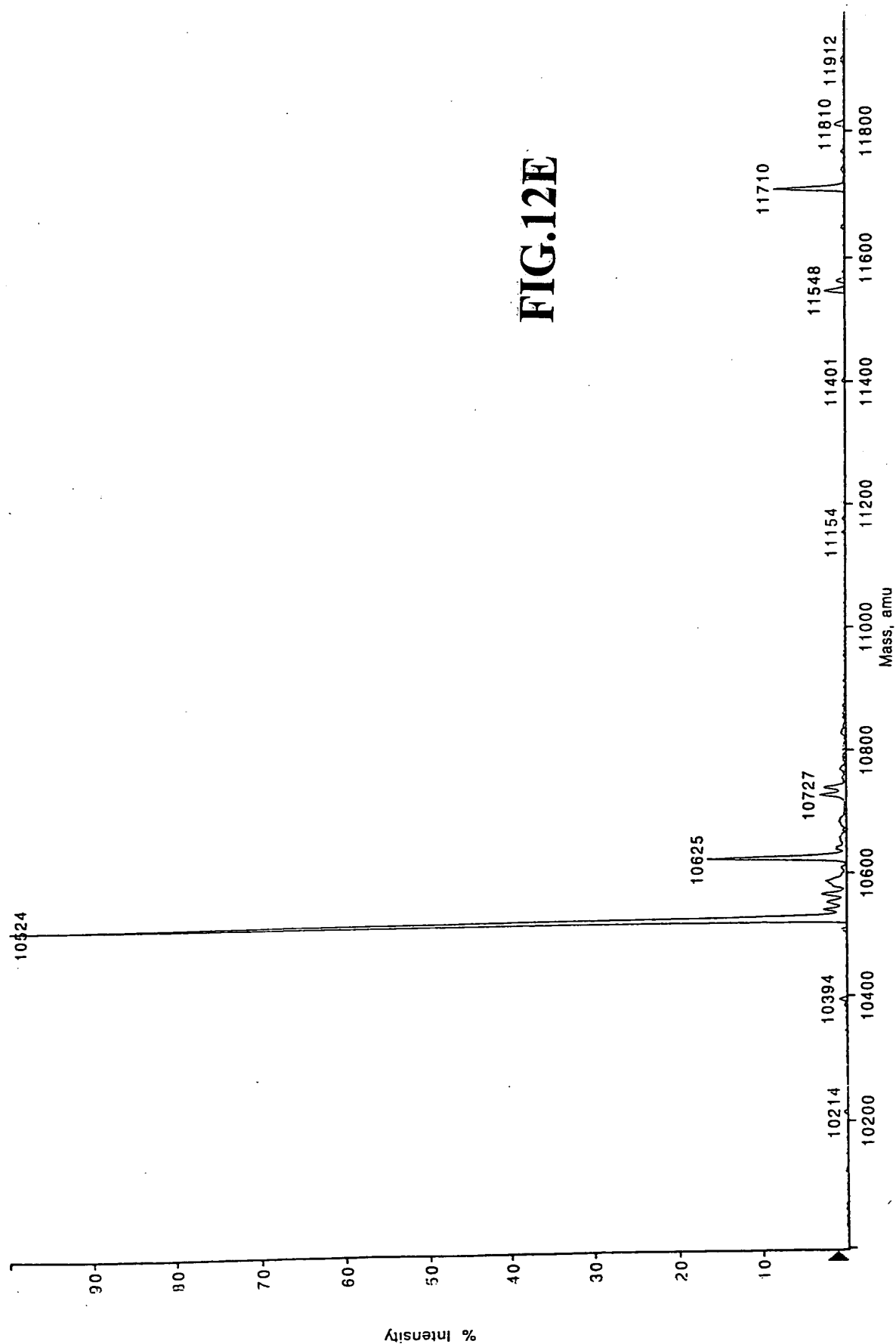
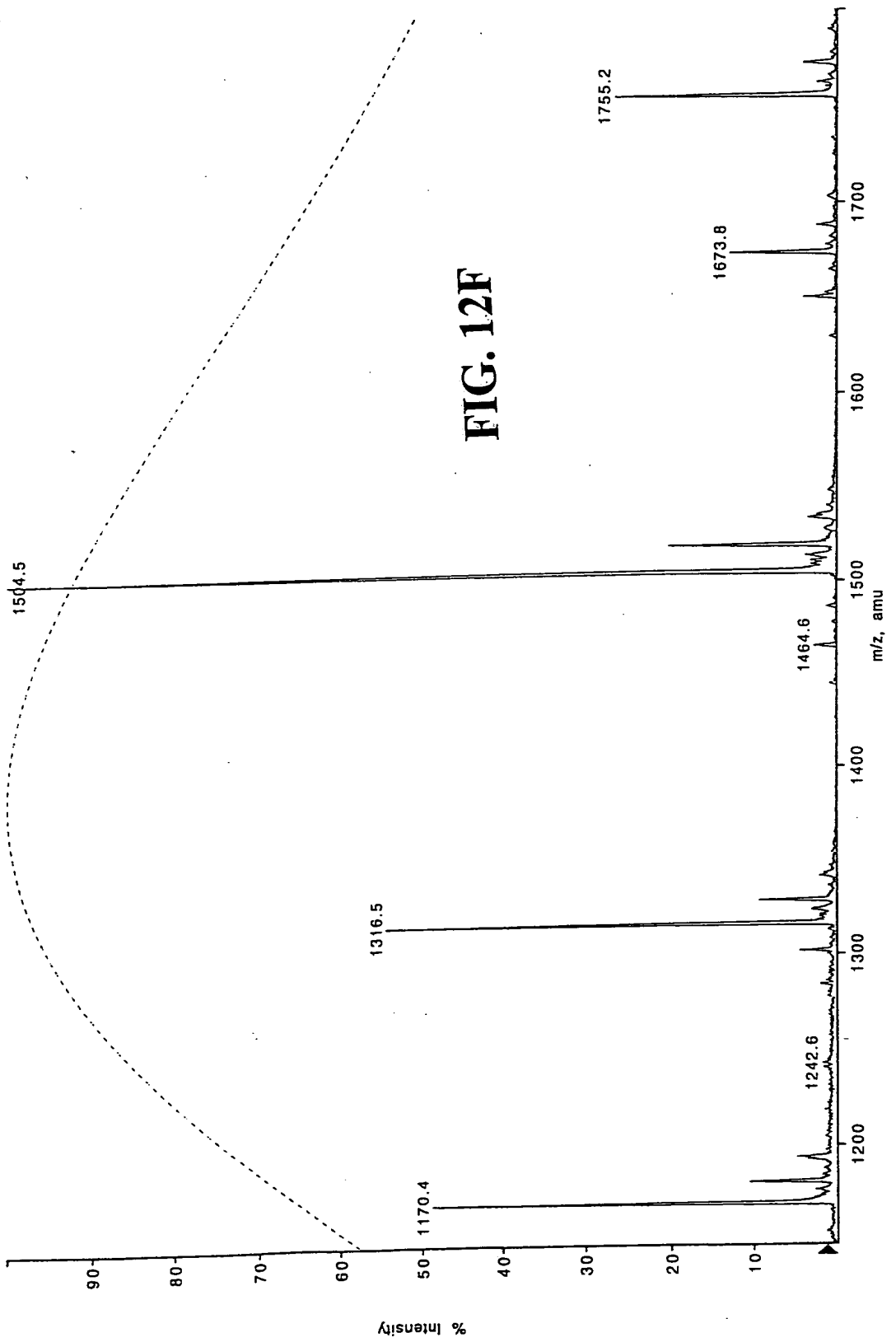


FIG.12E

(m/z SPECTRA P. VIVAX)

BioMultiView 1.3.1  
SL/SV19H/InMSpo/b/23/7/98 (Institut Pasteur/CSM#API365#Shirley Longacre/SV19H prep 7/7/98 P.Vivax MSP1 p19dli 100µl [10%HCOOH/MeOH 1/1] @ Inf. 5µl/mn IonSpi  
Period 1, Expt. 1; Mass range: 1150.0 to 1800.0 by 0.1 amu; Dwell: 2.0 ms; Pause: 2.0 ms  
Acq. Time: Jeu 23 jui 1998 at 10:50:11

+Q1 MCA (10 scans): from SL/SV19H/InMSpo/b/23/7/98 3.71e6 cps



(NOESY CYNOMOLGI)

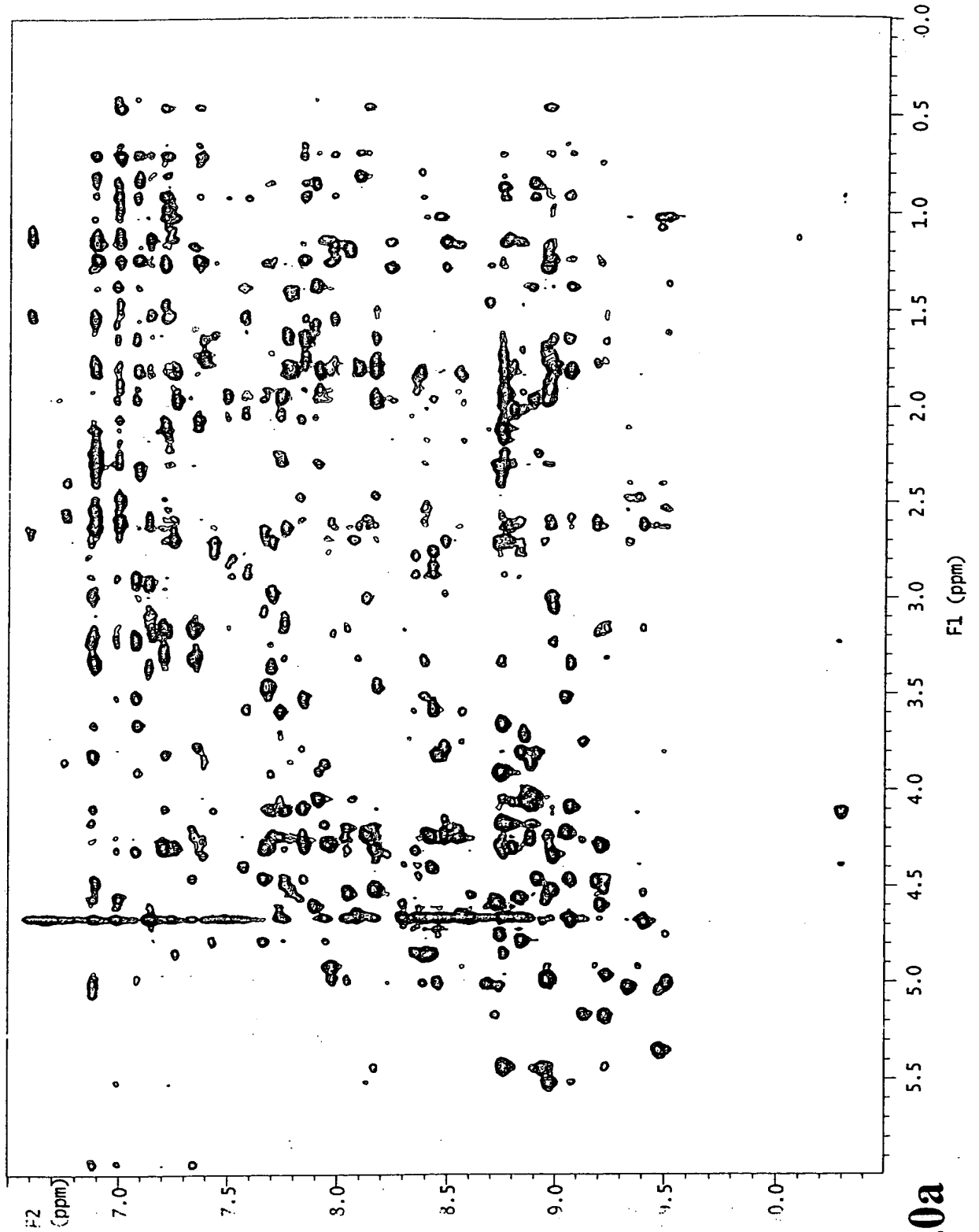


FIG.12.0a

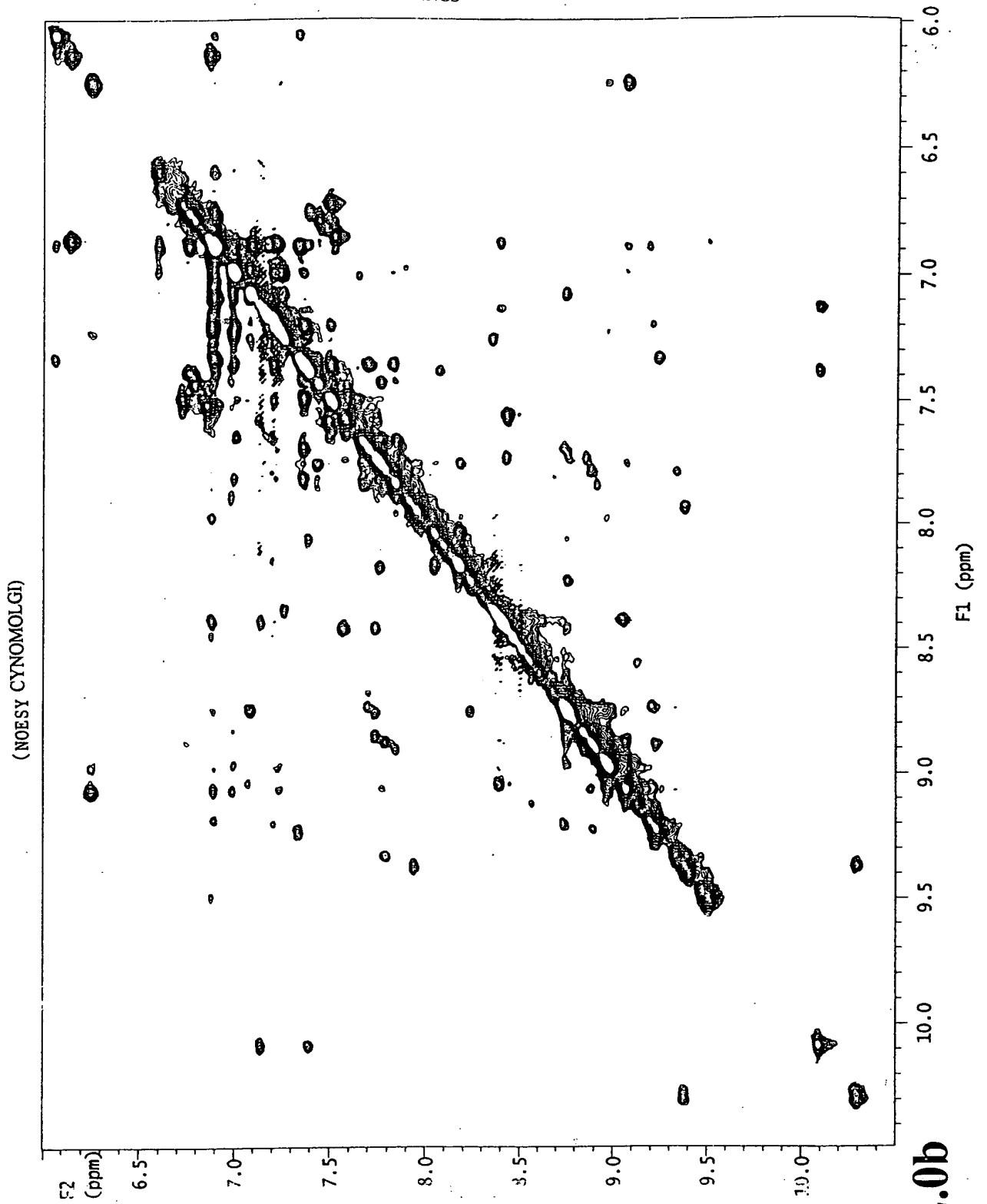


FIG. 12.0b

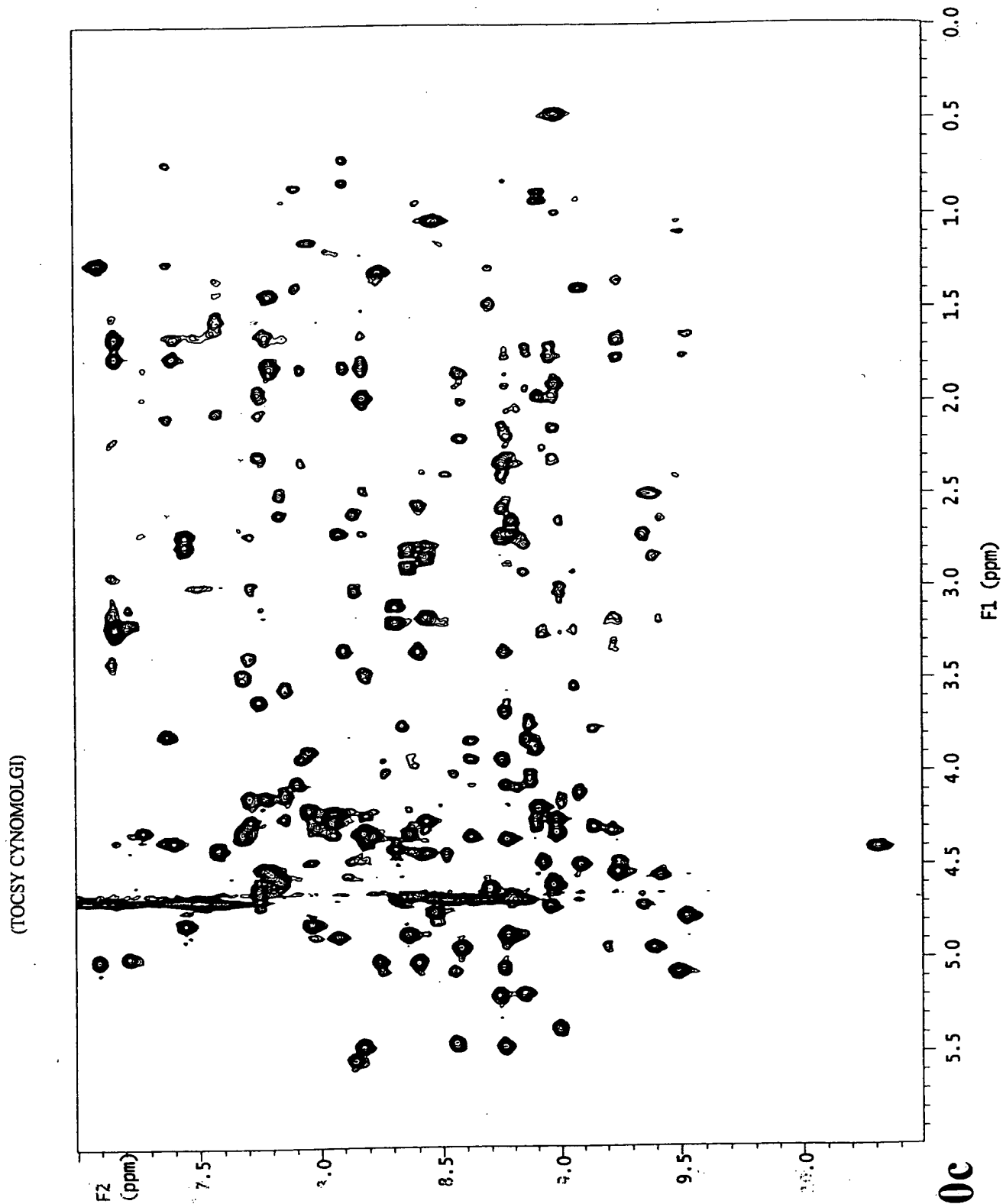


Fig. 12.0c

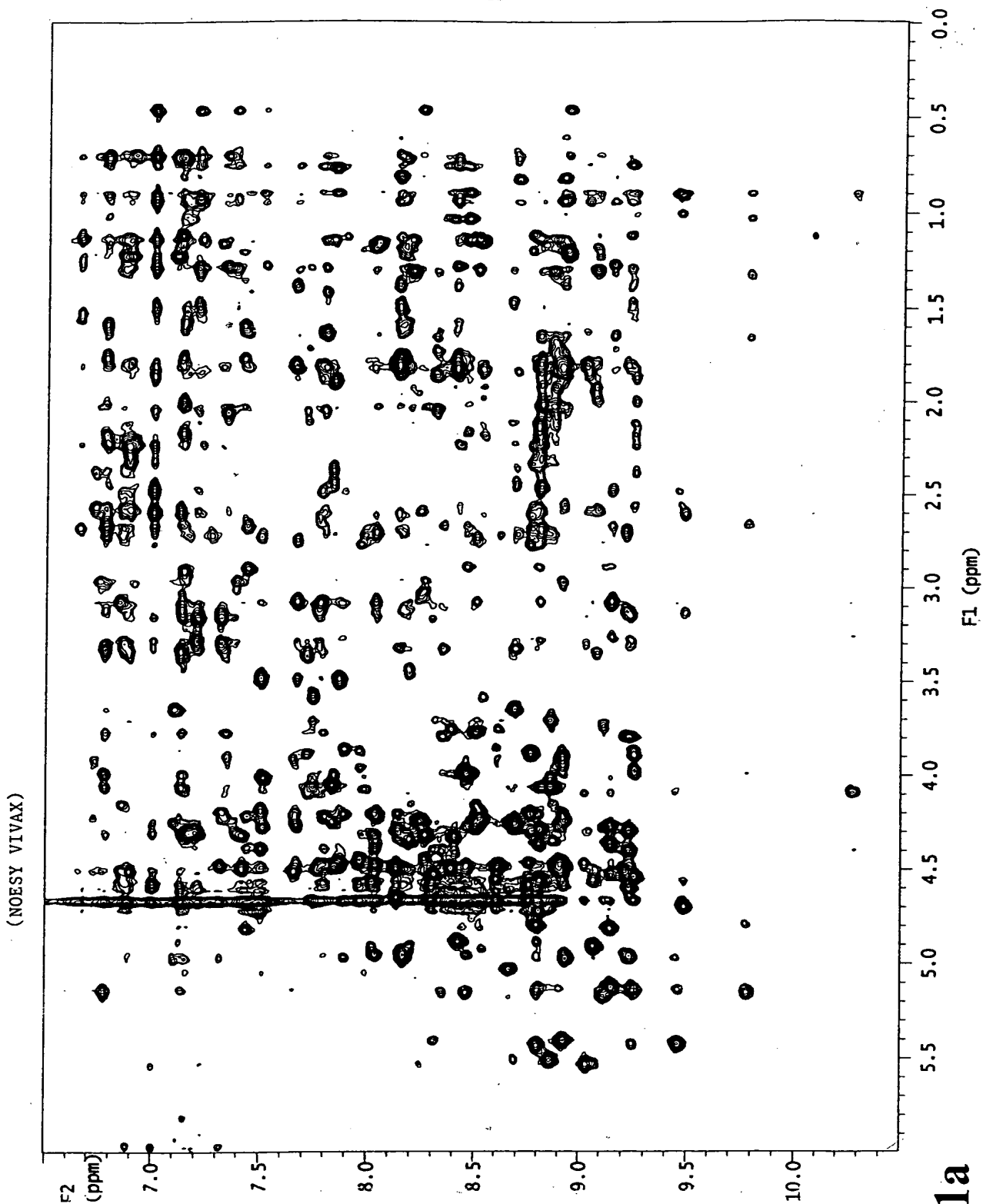


FIG. 12.1a



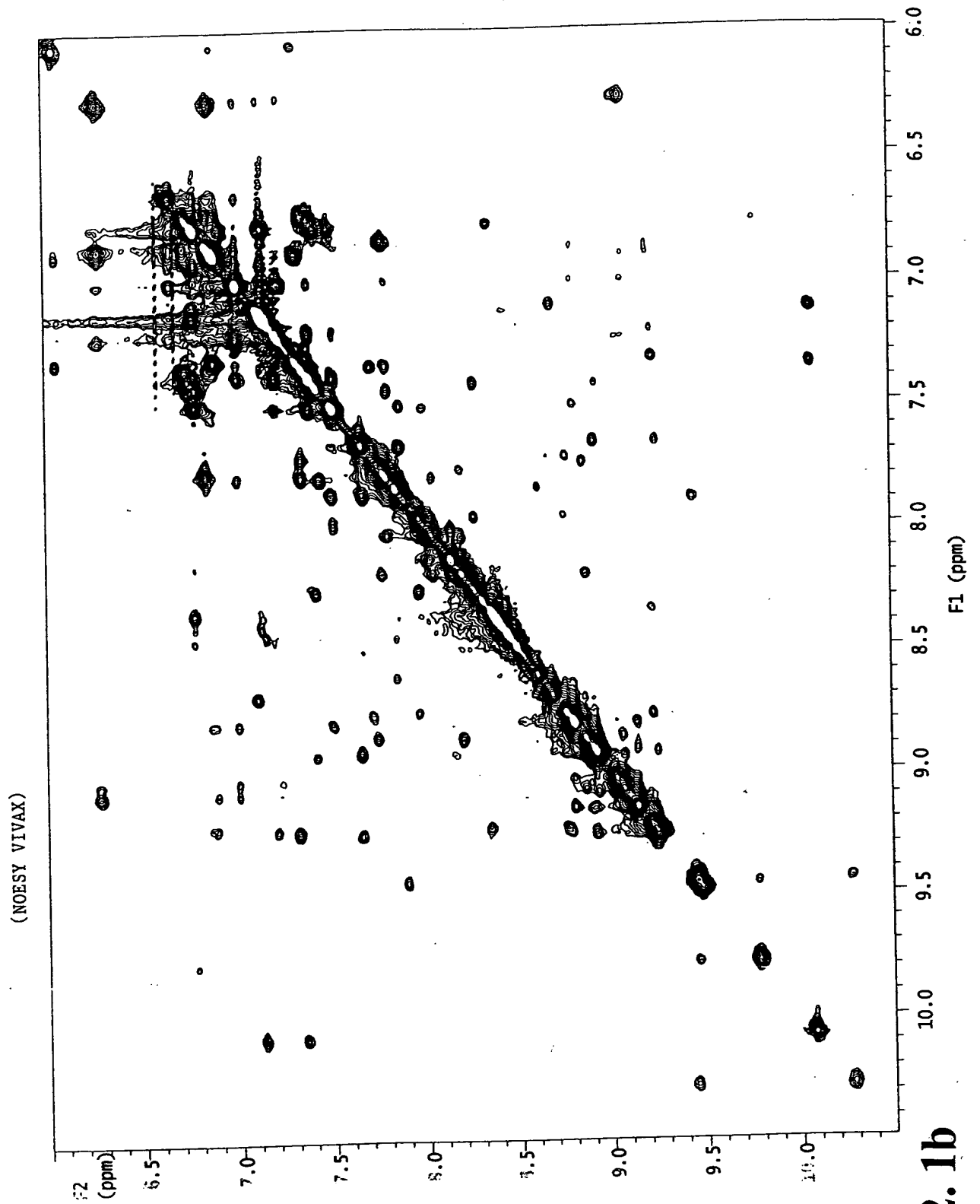


FIG. 12. 1b

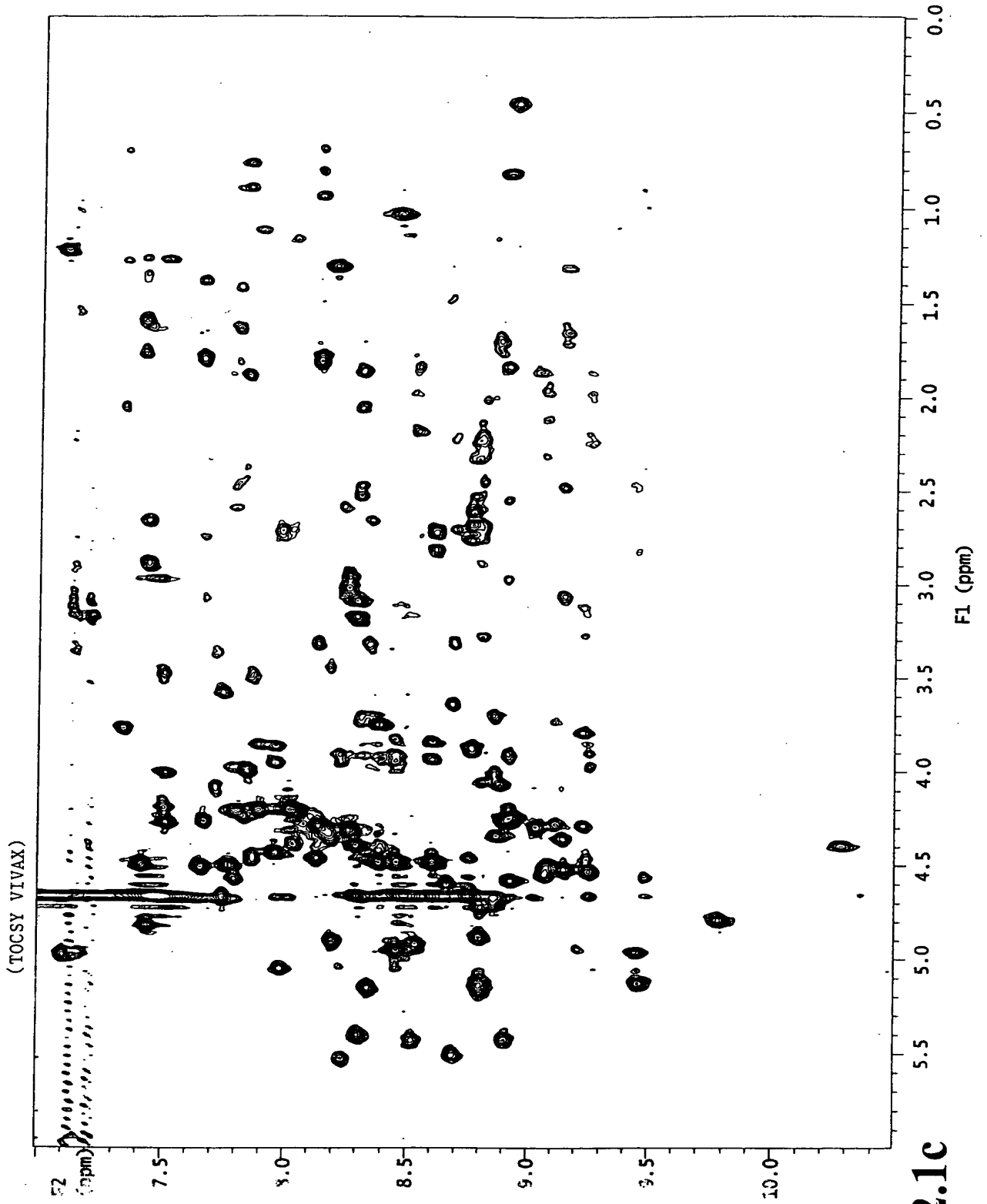


FIG. 12.1c

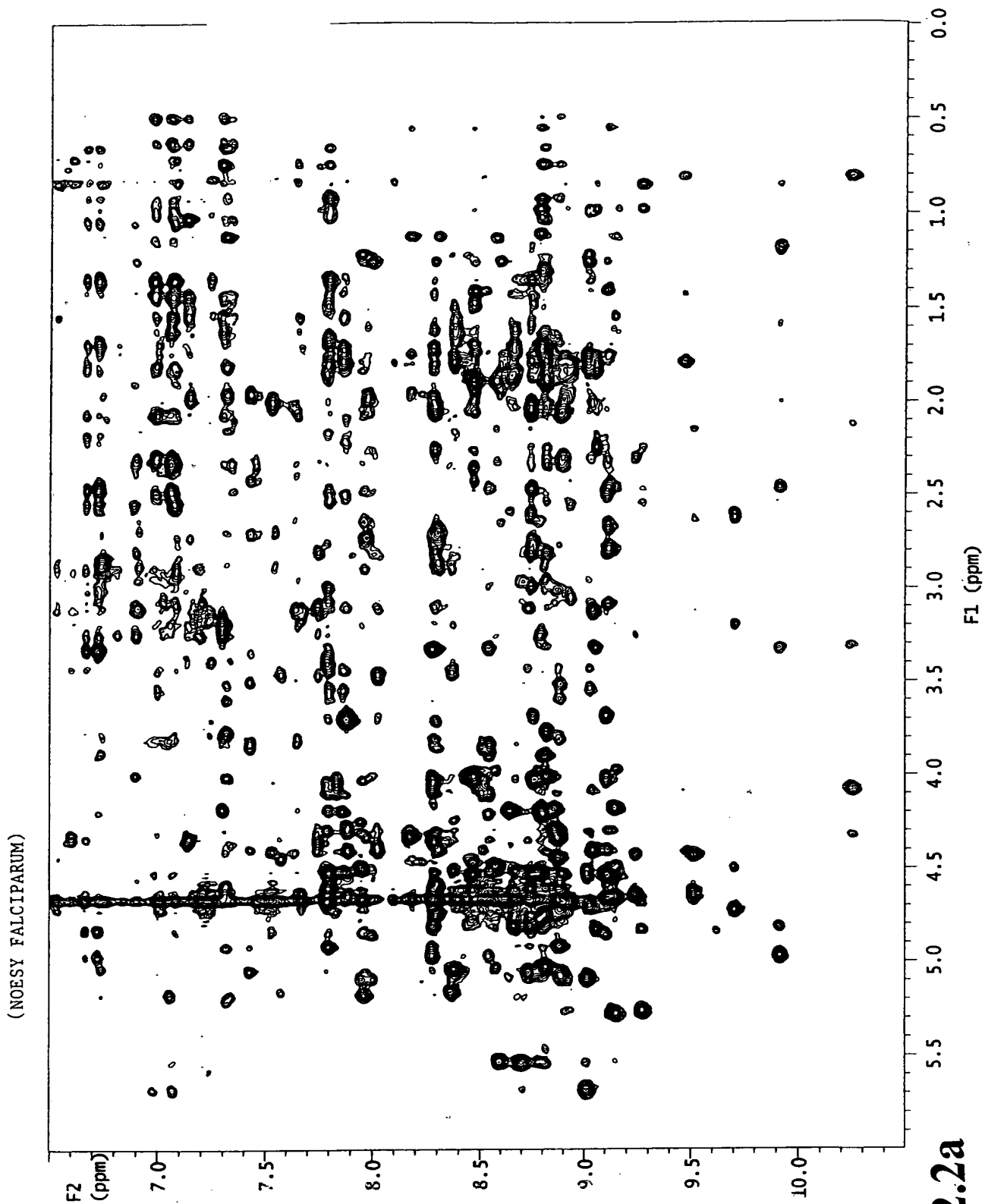


FIG. 12.2a

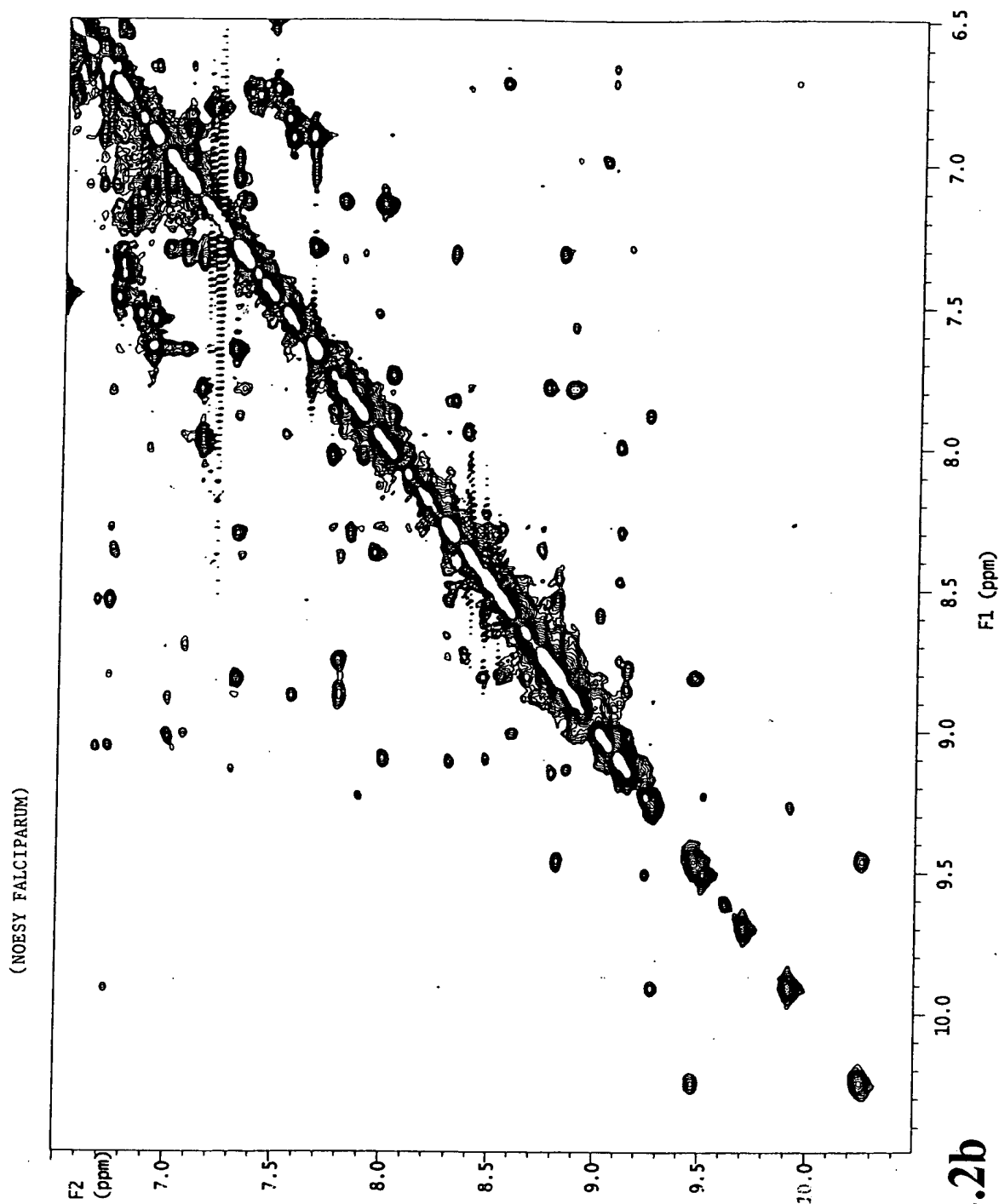
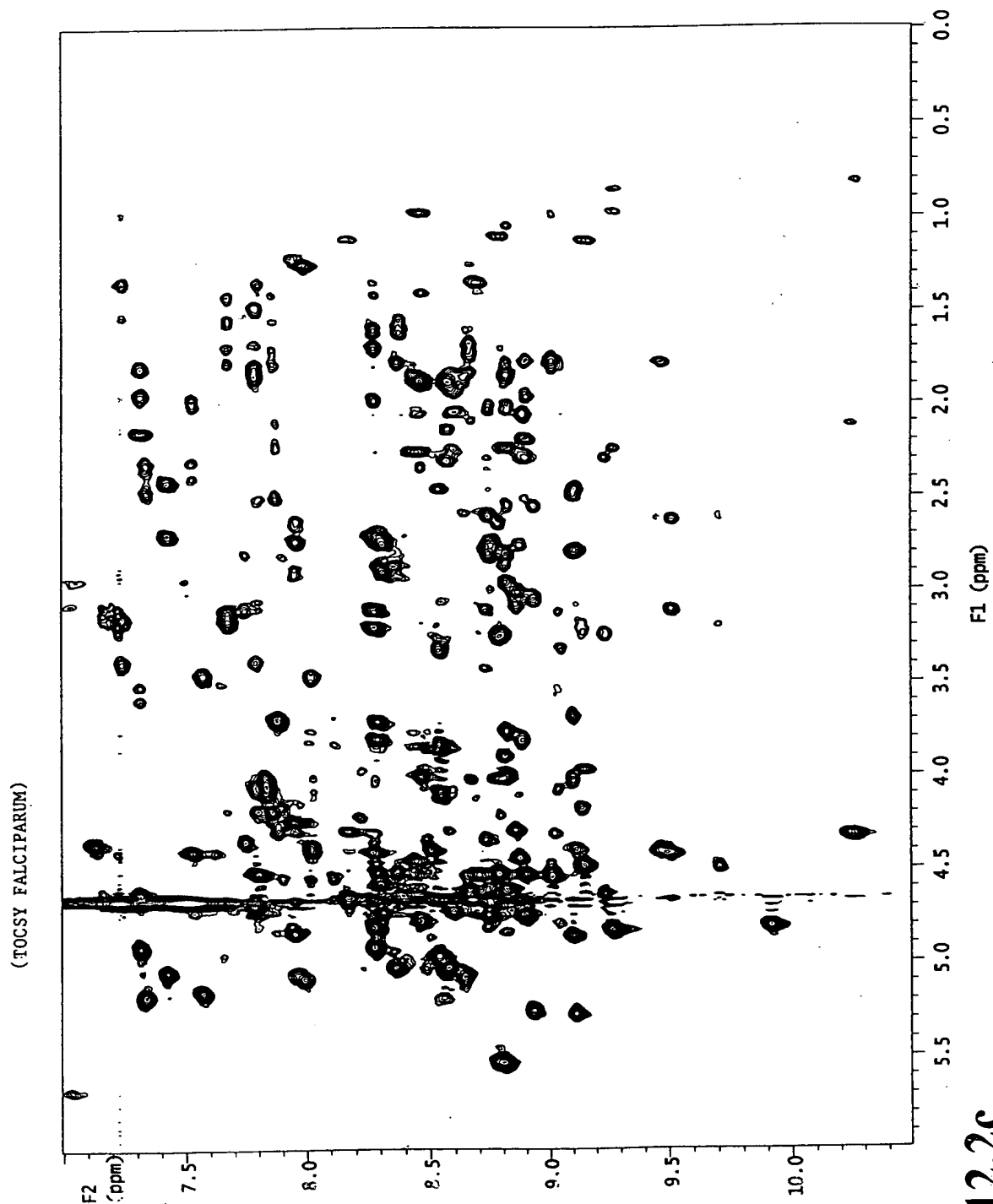


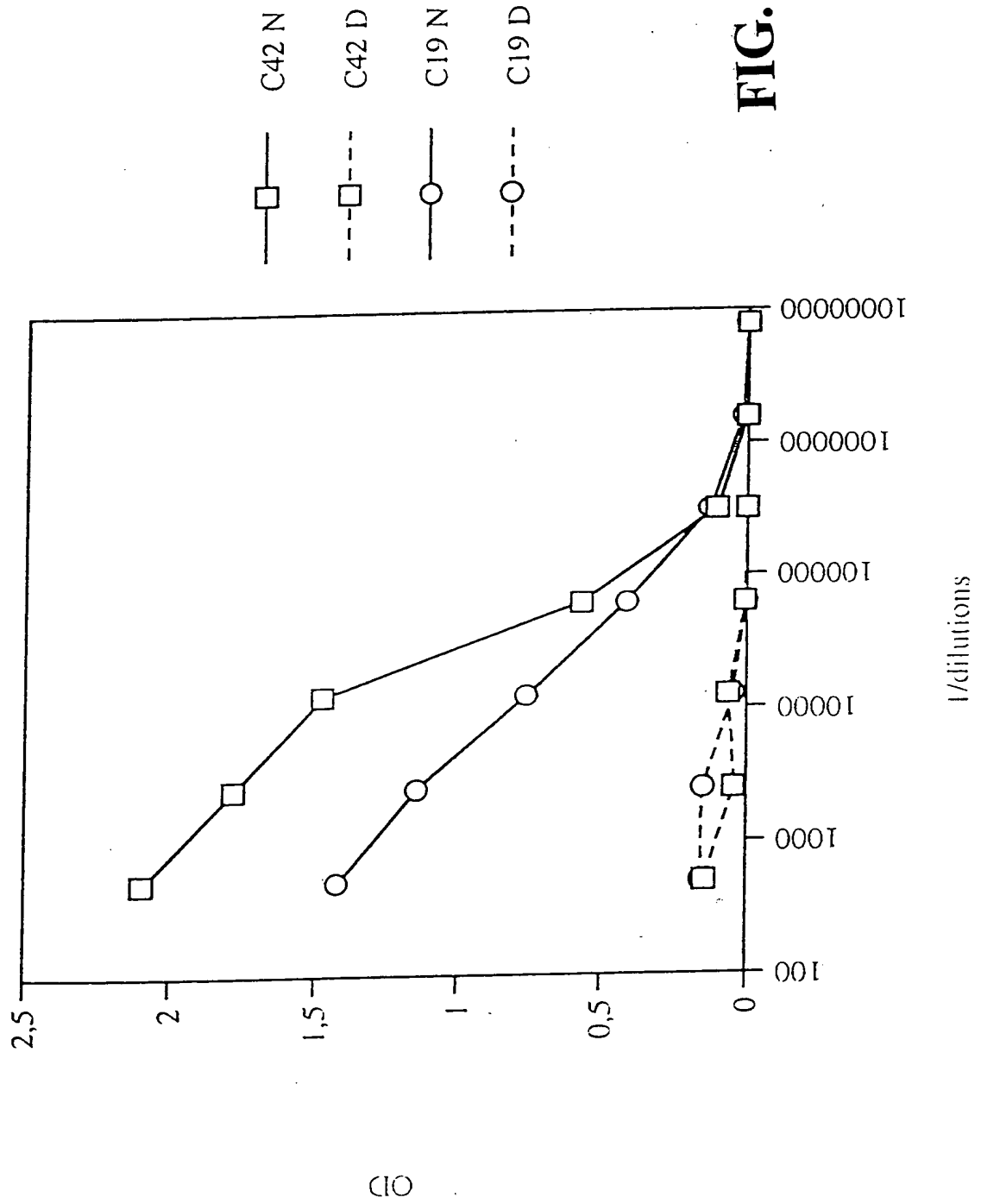
FIG. 12.2b

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USSN 09/134,333  
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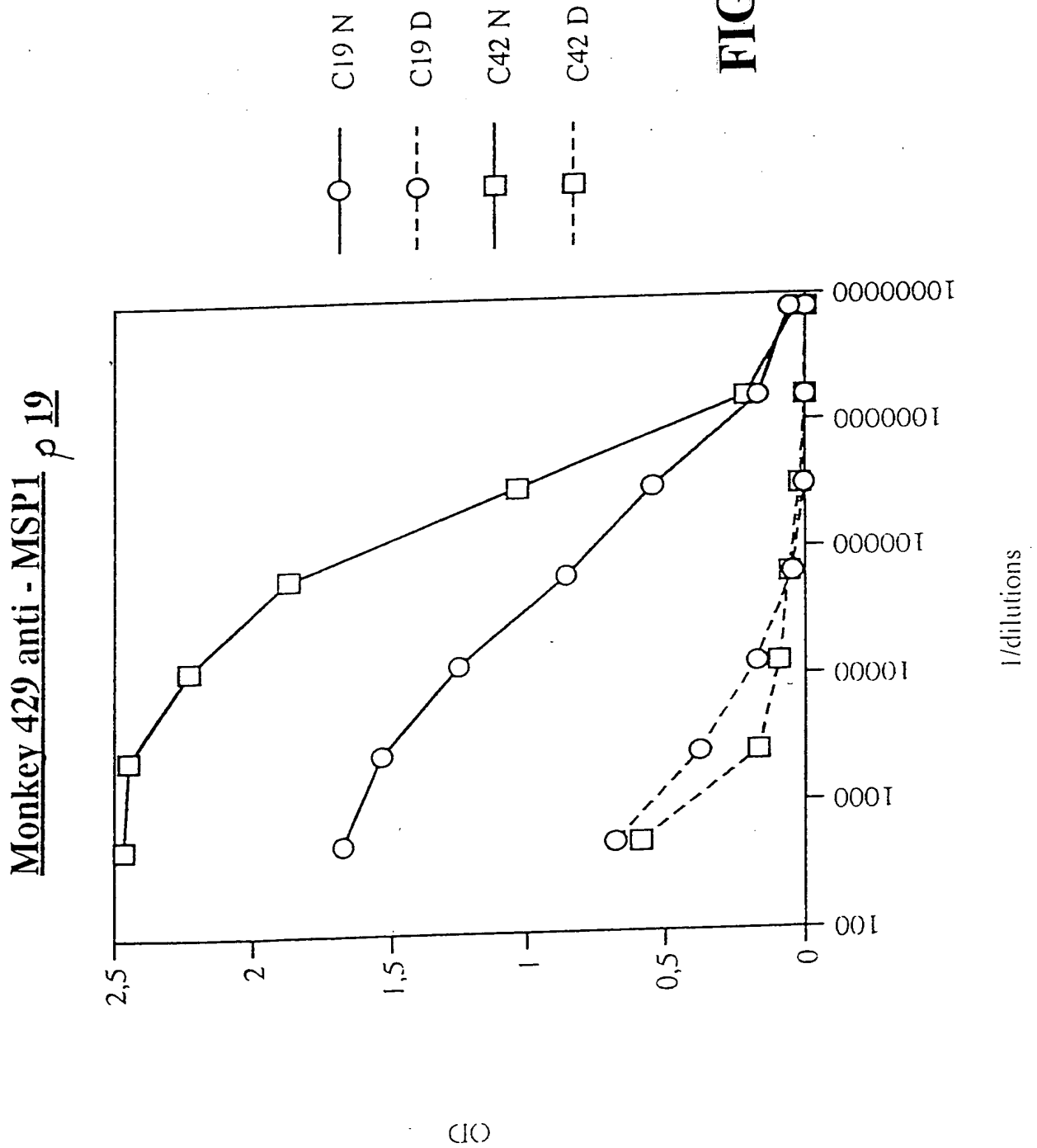
IG. 12.2c

Monkey 426 anti-MSP1<sub>p 19</sub>



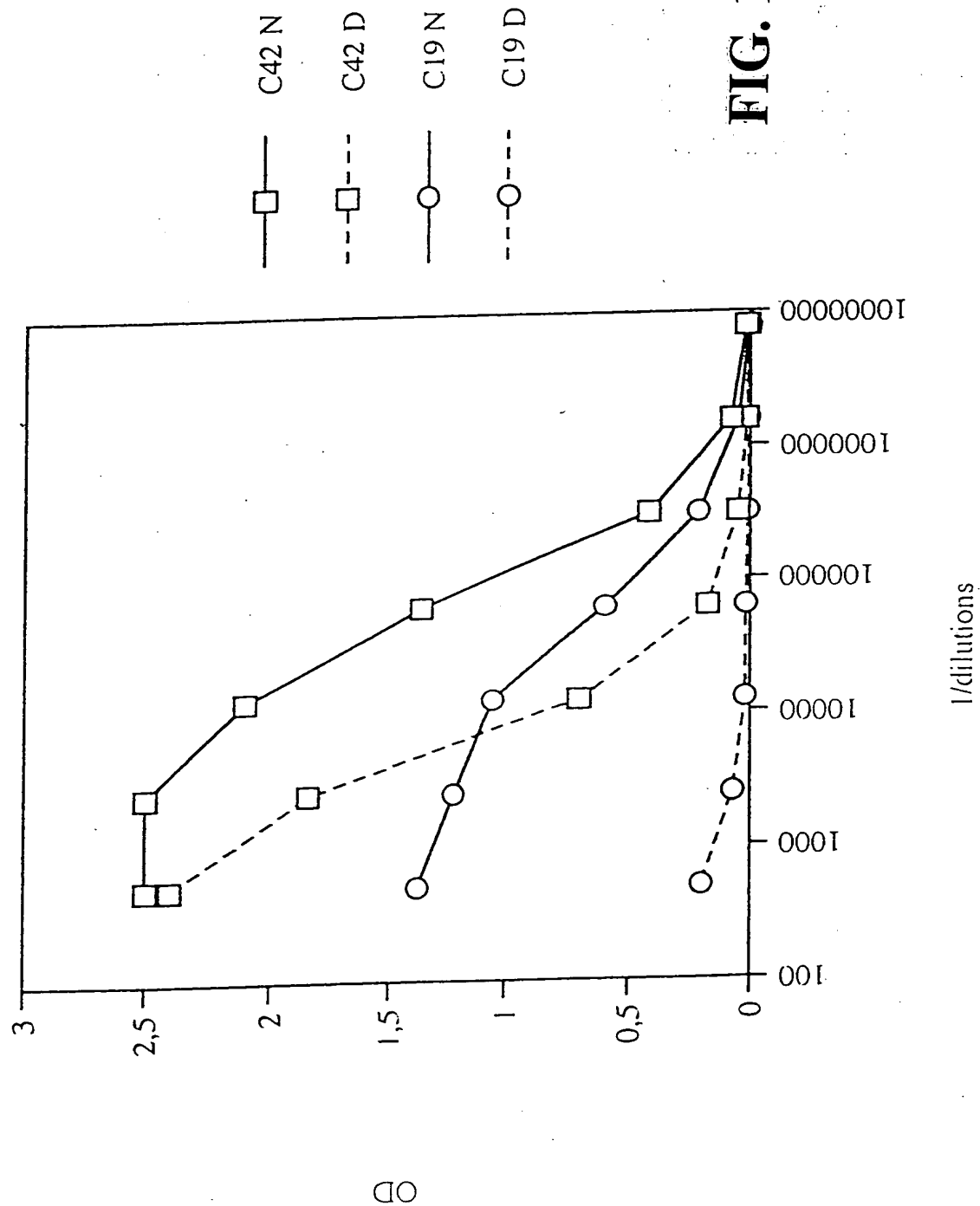
**FIG. 13A**







Monkey 428 anti - MSP1 p 42



**FIG. 13D**

Monkey 434 anti - MSP1 p 42

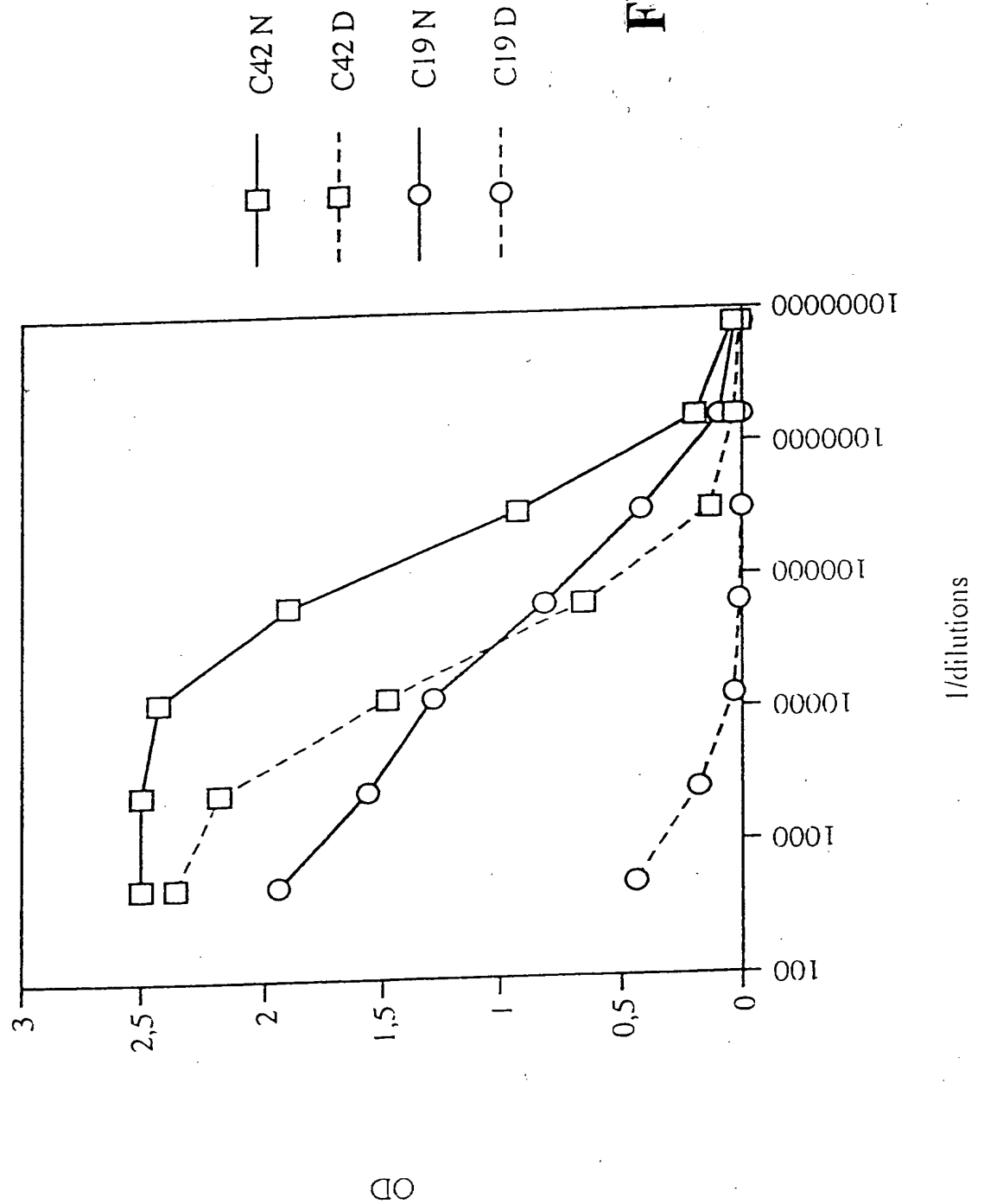


FIG. 13E

Monkey 435 anti - MSP1 p 42

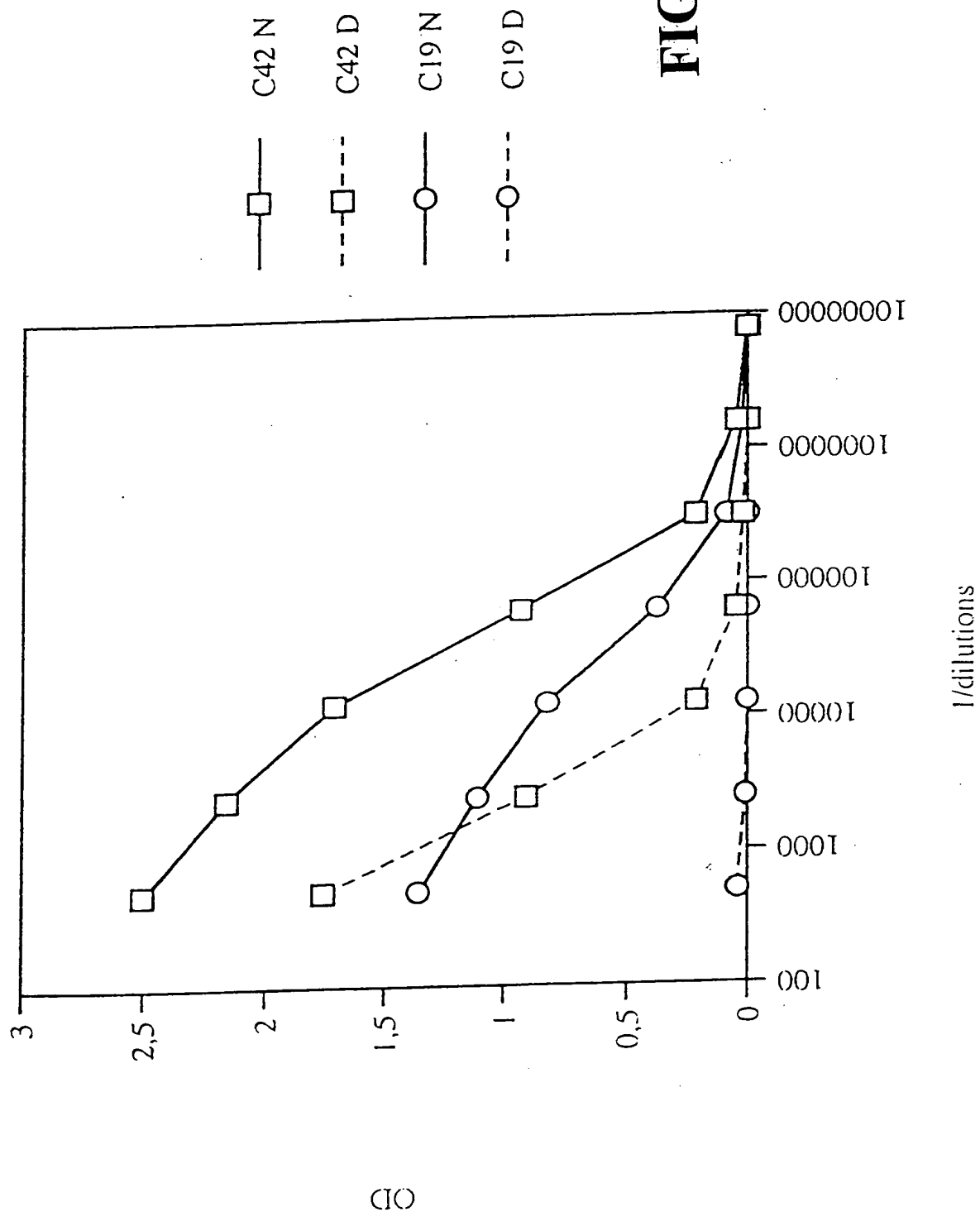
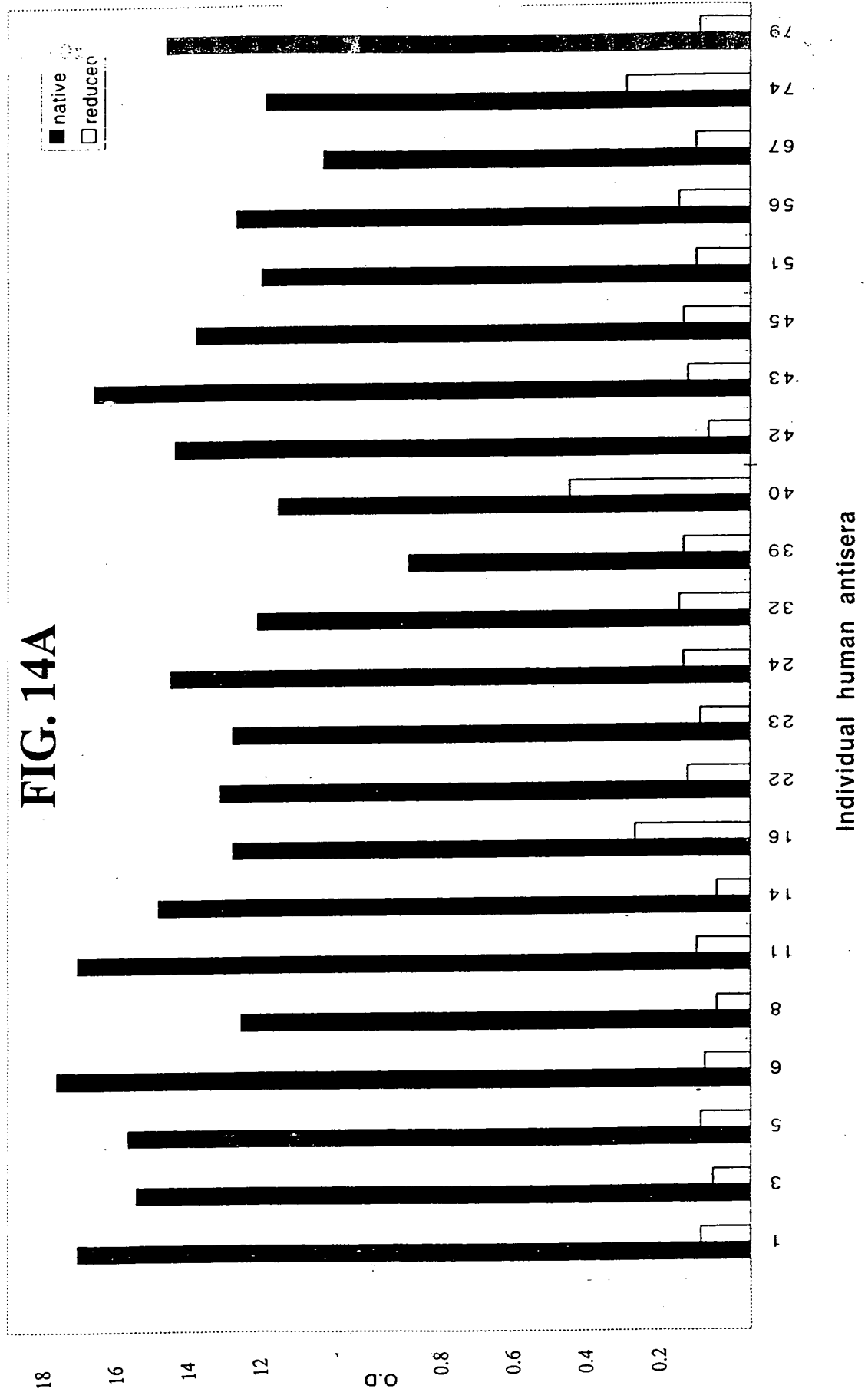


FIG. 13F

Endemic human antisera reactivity with recombinant *Plasmodium vivax* MSP1<sub>19</sub>  
(immuoaffinity purified)

FIG. 14A



Endemic human antisera reactivity with recombinant *Plasmodium vivax* MSP1<sub>19</sub>  
(metalloaffinity purified)

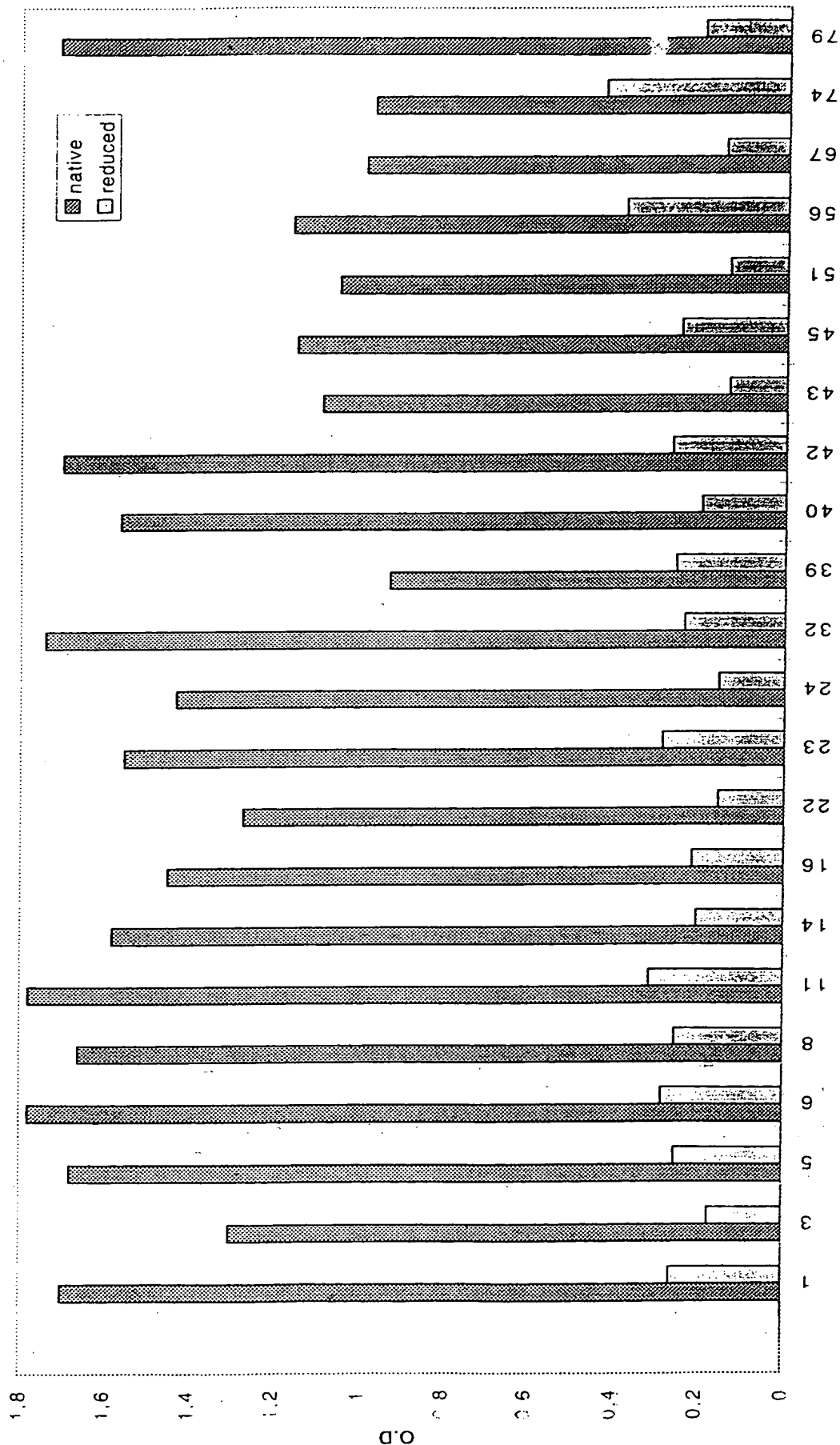
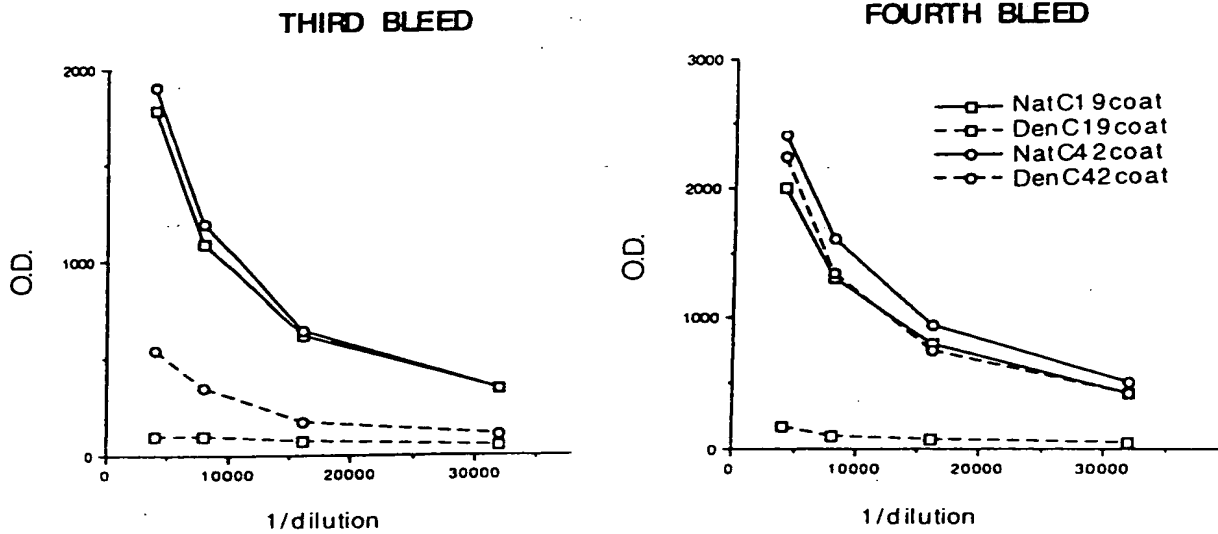
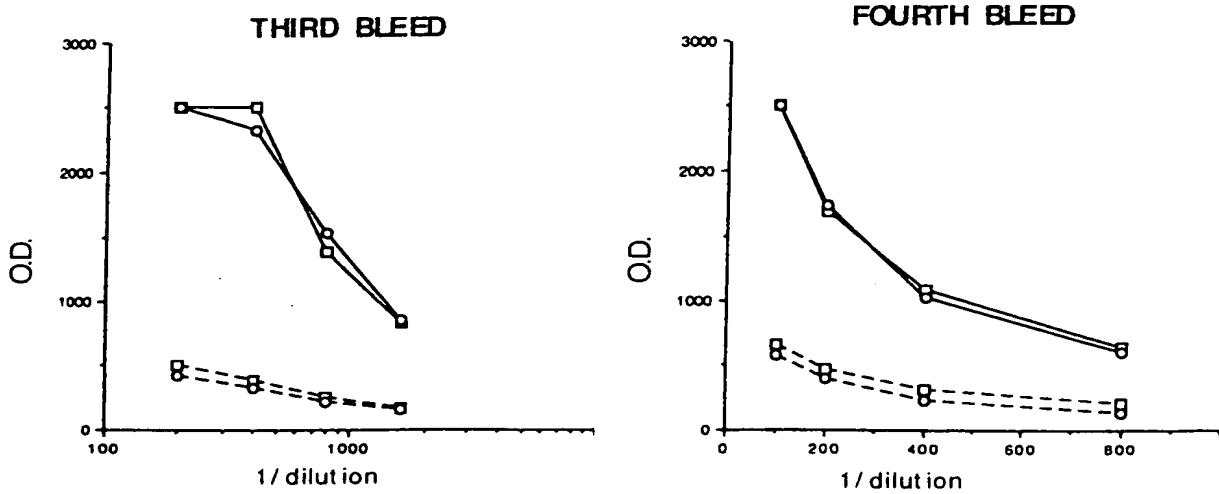


FIG. 14B

# ANTI-C42 RESPONSE



# ANTI-C19 RESPONSE



**FIG. 15**

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